

# **Integration Objects'**

## **OPC Alarms and Events Test Client**

**OPC AE Explorer**

**User Guide**  
**Version 1.1Rev.0**

**OPC Compatibility**

**OPC A&E 1.02**

OPC AE Explorer User Guide Version 1.1 Rev 0  
Published January 2018

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# PREFACE

## ABOUT THIS USER GUIDE

This guide:

- Describes the OPC AE Explorer, its features and its functionalities,
- Lists the system requirements for installing and running this OPC Client,
- And explains how to manage its configuration.

## TARGET AUDIENCE

This document is intended for Integration Objects' OPC AE Explorer users. Basic knowledge of OPC AE (Alarms and Events) specification is assumed.

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# INTRODUCTION

## 1. OVERVIEW

**Integration Objects' OPC Alarms & Events Explorer** is a fully compliant OPC AE client that allows you to monitor alarms and events from one or more OPC AE servers connected to your network. By using the OPC AE Explorer, you can determine the server configuration settings (filters, conditions, sub-conditions, etc.) and filter the plant alarms and events in which you are interested.

## 2. ARCHITECTURE

The following diagram illustrates a typical architecture for the **Alarms and Events Explorer**. The **Alarms and Events Explorer** communicates with the available OPC alarms and events servers, retrieves and displays alarms in a user-friendly graphical environment.

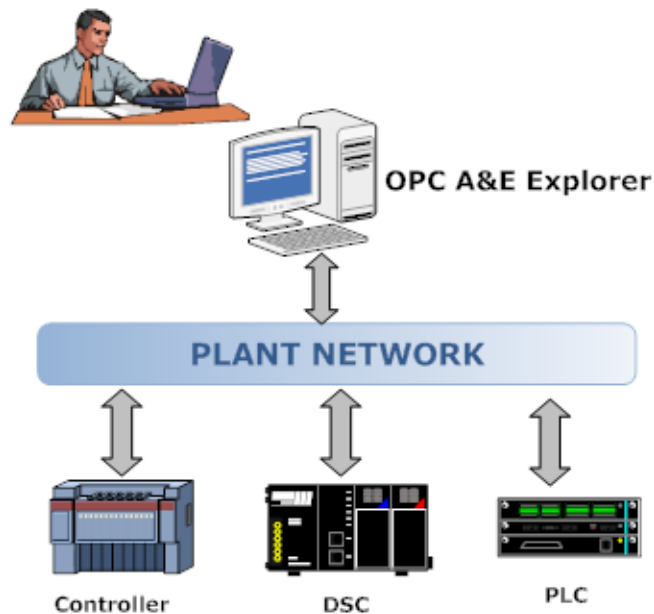


Figure 1: System Architecture

### 3. OPC AE EXPLORER FEATURES

**Integration Objects' Alarms and Events Explorer** allows the user to view all triggered OPC alarms and events across the network in a user-friendly format and to combine related data from different OPC alarm and event servers into a convenient and practical environment. The user can also control the alarm characteristics' updates stored in these OPC AE servers more efficiently and more accurately.

### 4. OPC COMPATIBILITY

Integration Objects' OPC AE Explorer supports OPC Alarms and Events (AE) version 1.02.

### 5. OPERATING SYSTEM COMPATIBILITY

Integration Objects' OPC AE Explorer runs under the following operating systems:

- Windows XP SP1, SP2 and SP3
- Windows Server 2003
- Windows 7
- Windows 8 and 8.1
- Windows Server 2008
- Windows Server 2012
- Windows 10
- Windows Server 2016

### 6. SYSTEM REQUIREMENTS

**Integration Objects' OPC Alarms and Events Explorer** installation requires the following minimum runtime system specifications:

- Pentium 100MHz processor or higher recommended
- 128 MB of RAM. 216 MB recommended
- 10 MB hard disk space for full installation



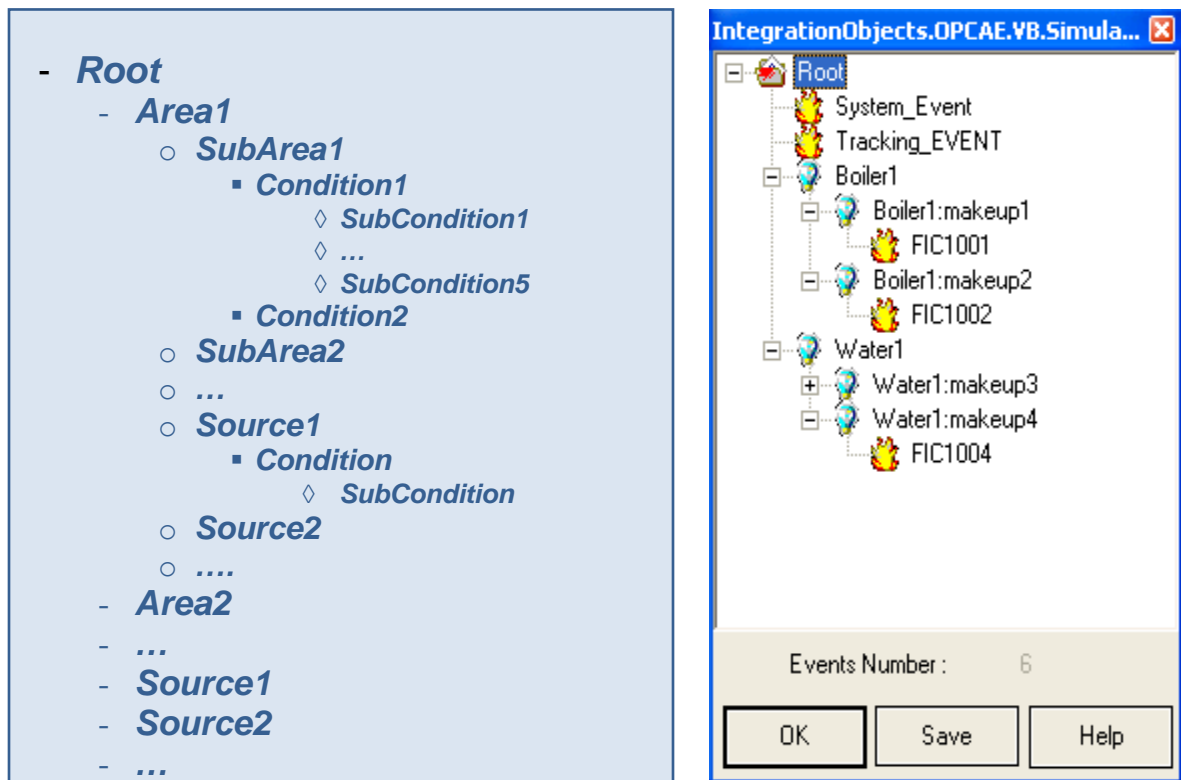
## 7. OPC ALARM AND EVENT EXPLORER FUNCTIONALITIES

### *Connection to all available OPC alarm and event servers (local & remote)*

The user can connect to one or more, local or remote, alarms and events servers at the same time.

### *Browsing of all data sources available in OPC Alarm and Event servers*

The AE Explorer provides the possibility to browse all alarm and event sources. The organization is done according to plant areas and sub-areas as shown below.

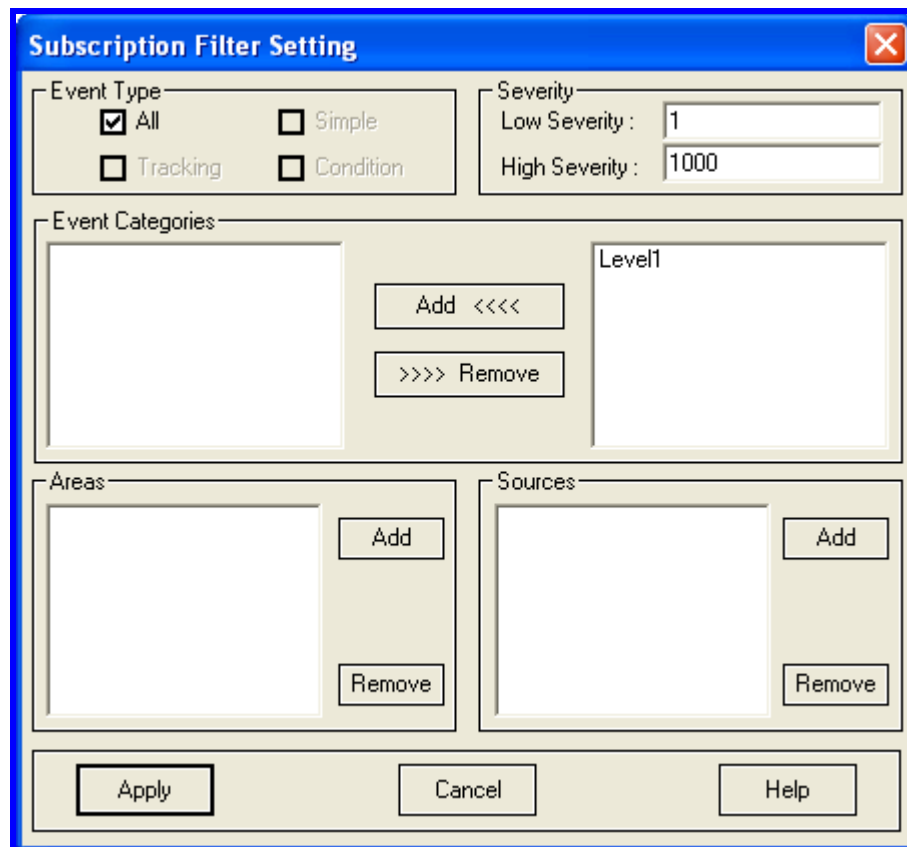


**Figure 2: Browsing Data Sources**

### *Filtering of the retrieved alarms and events according to several criteria*

With the AE Explorer, the user can set filters on any event subscription in order to limit the events that he will be notified of. To setup a filter for an event subscription, the user can use the following criteria:

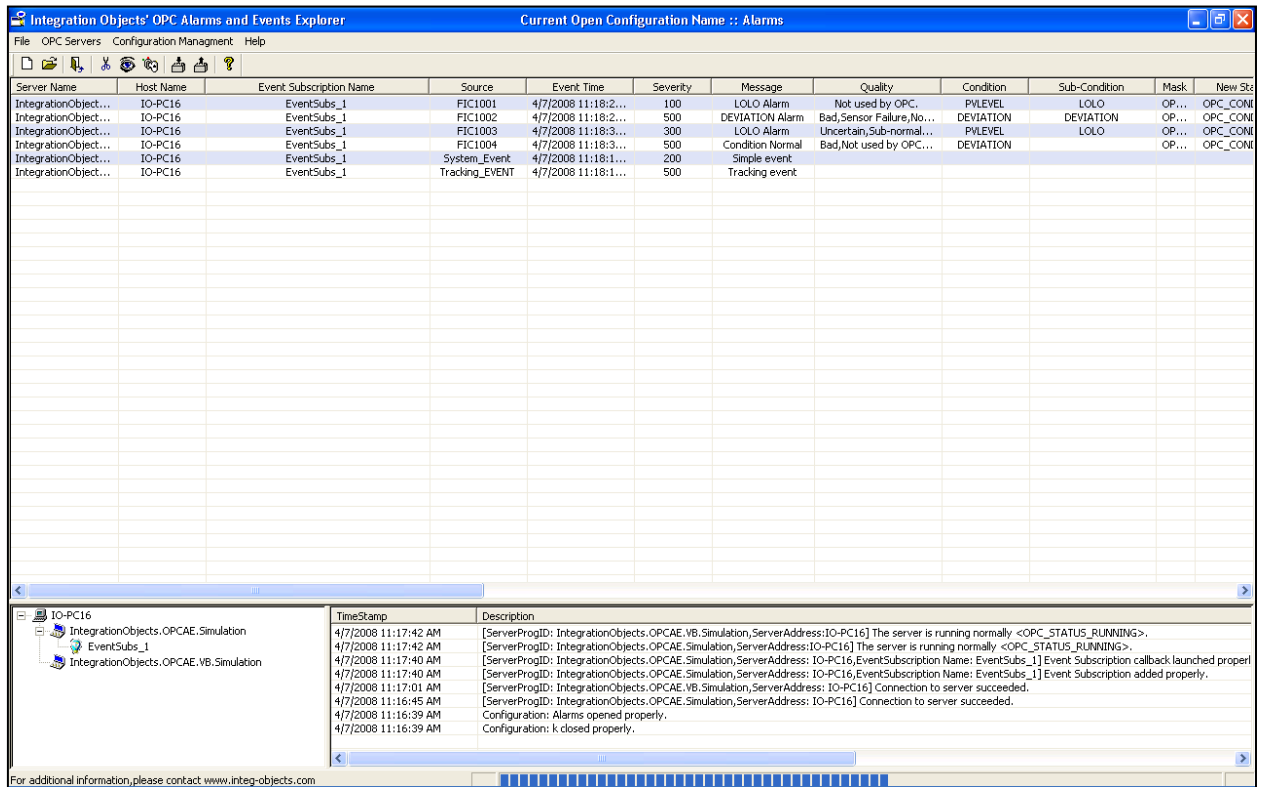
- **Filtering by Event Type:** only events satisfying the criterion “Event Type” will be returned.
- **Filtering by Event Categories:** only events satisfying the criterion “Event Categories” will be returned.
- **Filtering by Areas and Sources:** only events satisfying the criterion “Existing in these areas or having these sources” will be returned.
- **Filtering by Severity:** only events satisfying the criterion “Events that have a severity between the min and the max severity” will be returned.
- Users can select multiple criteria. They will be logically ANDed together. Then all events satisfying all these selected criteria will be returned.



**Figure 3: Subscription Filter Settings**

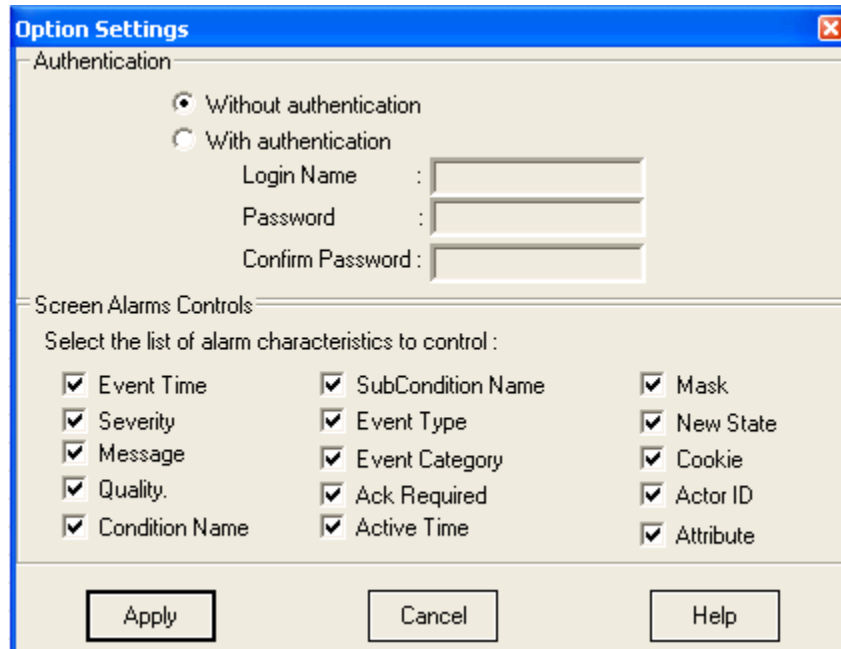
**Real-time capturing of the alarms and events fired by the OPC AE servers**

The alarms and events fired by OPC AE servers are displayed in a screen view in real-time. Therefore, users can monitor the alarm characteristics' changes over time.



**Figure 4: OPC A&E Explorer Main Interface**

*Graphical browsing of alarm characteristics from any OPC A&E server*



**Figure 5: Option Settings**

A screen view shows all information relating to alarms and events:

- Event Time
- Severity
- Message
- Quality
- Condition Name
- SubCondition Name
- Event Type
- Event Category
- Ack Required
- Active Time
- Mask
- New State
- Cookie

- Actor ID
- Attribute

Users can hide one or more of these characteristics according to his needs.

#### ***Point click configuration***

In the OPC AE Explorer, the user can set more than one configuration. There is also a default one that is started automatically when launching the application. This configuration will save all connected OPC AE servers, added event subscriptions and related filters.

#### ***Log event display and file***

The user can follow the operations handled by the OPC AE Explorer by using either the log view or the log file.

The Explorer logs all OPC calls, even when successful and handles OPC system and network errors.

# GETTING STARTED

## 1. INSTALLING AND RUNNING

This section explains how to install and run the OPC AE Explorer.

### 1.1. INSTALLING

The installation program for the **OPC AE Explorer** can be downloaded from the Integration Objects' website.

To start the installation, double click on the installation program and follow the instructions presented by the installation wizard.

The installation copies all necessary files to the target computer, creates a short-cut icon in the start menu and makes an un-installation entry in the Add/Remove Programs Window in the Control Panel.

To start the **OPC A&E Explorer**, click **Start → Programs → Integration Objects → OPC Explorer → OPC Alarms and Events Explorer**.



**The Alarms and Events Explorer does not require initial configuration. It is configured by default for first use.**

### 1.2. STARTING-UP

When launching the **Alarms and Events Explorer**, there are two possible cases:

### 1.2.1. FIRST USE OF THE OPC ALARMS AND EVENTS EXPLORER

In this case, there is no default configuration launched at the application startup. The first time the user wants to use the Explorer, he has to create a new configuration and save it as a default one.

### 1.2.2. ONE OR MORE CONFIGURATIONS ALREADY EXIST

In this case, the **Alarms and Events Explorer** automatically loads the default configuration. The main window related to this case is shown in the figure below.

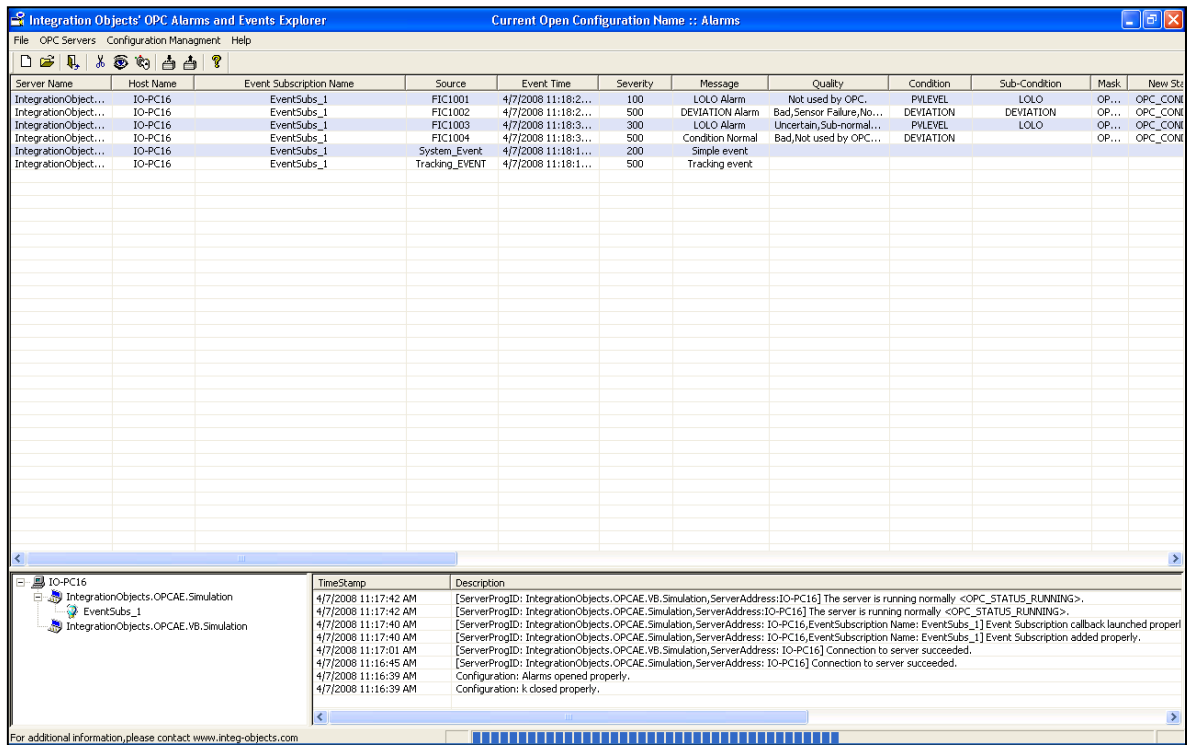
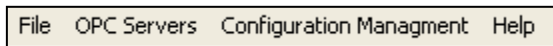


Figure 6: OPC AE Explorer Main Interface Displaying Default Configuration

The main window consists of a menu bar, a toolbar and three sub-views:

**Menu Bar**



**Tool Bar**



**Sub-Views Presentation**

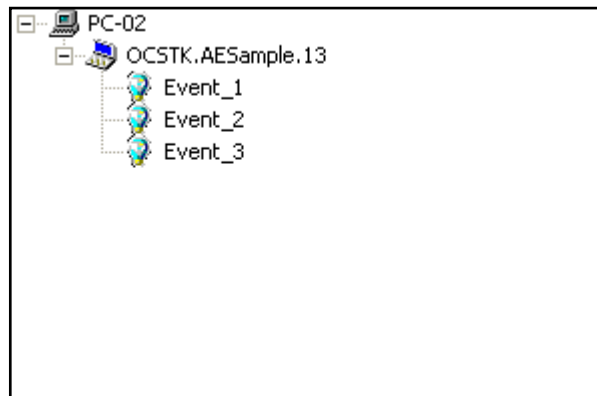
**The Top List View** contains the information related to alarm characteristics reported by the different connected OPC alarm and event servers. In this view, the user can view alarm characteristics' updates such as event time, severity, condition name, event type, etc.

Users can activate or deactivate the posting of these updates.

Server Name	Host Name	Event Subscription Name	Source	Event Time	Severity	Message	Quality	Condition	Sub-Condition	Mas
IntegrationObject...	IO-PC16	EventSubs_k	FIC1004	4/7/2008 12:33:1...	500	Condition Normal	Good,Local override,N...	DEVIATION		OP.
IntegrationObject...	IO-PC16	EventSubs_k	System_Event	4/7/2008 12:32:5...	200	Simple event				
IntegrationObject...	IO-PC16	EventSubs_k	Tracking_EVENT	4/7/2008 12:32:5...	500	Tracking event				
IntegrationObject...	IO-PC16	EventSubs_k	FIC1001	4/7/2008 12:33:0...	100	LOLO Alarm	Bad,Sensor Failure,No...	PVLEVEL	LOLO	OP.
IntegrationObject...	IO-PC16	EventSubs_k	FIC1002	4/7/2008 12:33:0...	500	DEVIATION Alarm	Bad,Sensor Failure,No...	DEVIATION	DEVIATION	OP.
IntegrationObject...	IO-PC16	EventSubs_k	FIC1003	4/7/2008 12:33:1...	300	LOLO Alarm	Bad,Not Connected,N...	PVLEVEL	LOLO	OP.

**Figure 7: OPC A&E Explorer Top List View**

**The Tree View:** It contains the information related to the list of the configured OPC alarm and event servers by the user.



**Figure 8: OPC A&E Explorer Tree View**

**The List View:** The user can monitor actions processed by the OPC AE Explorer by using this log view.

TimeStamp	Description
4/7/2008 11:32:12 AM	[ServerProgID: IntegrationObjects.OPCAE.Simulation,ServerAddress:IO-PC16] A vendor specific fatal error occurred within the server.The server is no longer r...
4/7/2008 11:32:07 AM	[ServerProgID: IntegrationObjects.OPCAE.VB.Simulation,ServerAddress:IO-PC16] A vendor specific fatal error occurred within the server.The server is no longe...
4/7/2008 11:17:42 AM	[ServerProgID: IntegrationObjects.OPCAE.VB.Simulation,ServerAddress:IO-PC16] The server is running normally <OPC_STATUS_RUNNING>.
4/7/2008 11:17:42 AM	[ServerProgID: IntegrationObjects.OPCAE.Simulation,ServerAddress:IO-PC16] The server is running normally <OPC_STATUS_RUNNING>.
4/7/2008 11:17:40 AM	[ServerProgID: IntegrationObjects.OPCAE.Simulation,ServerAddress: IO-PC16,EventSubscription Name: EventSubs_1] Event Subscription callback launched proj...
4/7/2008 11:17:40 AM	[ServerProgID: IntegrationObjects.OPCAE.Simulation,ServerAddress: IO-PC16,EventSubscription Name: EventSubs_1] Event Subscription added properly.
4/7/2008 11:17:01 AM	[ServerProgID: IntegrationObjects.OPCAE.VB.Simulation,ServerAddress: IO-PC16] Connection to server succeeded.



Figure 9: OPC A&E Explorer List View

## 2. REMOVING OPC AE EXPLORER

To remove the **Alarms and Events Explorer**:

1. If you have set one or more configurations, start the **Alarms and Events Explorer** and delete all these settings. When you finish, click close **Alarms and Events Explorer**.
2. Click **Start**.
3. Click **Settings**.
4. Click **Control Panel**.
5. Click **Add/Remove Programs**.
6. In the Add/Remove Programs dialog screen, select the **Alarms and Events Explorer**.
7. Click **Change/Remove** then **OK**.
8. The software will be removed.

# CONFIGURATION

## 1. CONFIGURATION MANAGEMENT

### 1.1. CREATE A NEW CONFIGURATION

To create a new configuration, the user can select:

- **File** then **New Configuration** in the Menu Bar.
- Or click the **New Configuration** icon in the Tool Bar.

A similar dialog screen appears:



**Figure 10: Add New Configuration**

To create a new configuration, the user should:

1. Type, in the **Configuration Name** text box, a valid unique name for the configuration.
2. Select "with" or "without" authentication.

If the user chooses the “with authentication” option, he must enter a Login Name (in **Login Name** text box) and a password (in **Password** text box).

3. Press the **Apply** button.

A new configuration is then created.

## 1.2. OPEN AN EXISTING CONFIGURATION

To open an existing configuration, the user can select:

- **File** then **Open Configuration** in the Menu Bar.
- Or click the **Open Configuration** icon in the Tool Bar.

A dialog screen similar to the figure below appears:

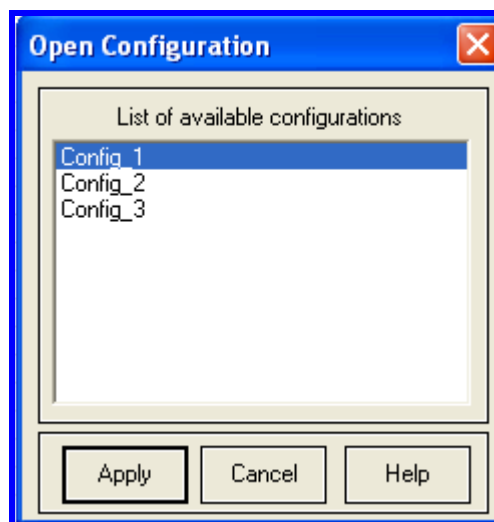


Figure 11: Open Configuration

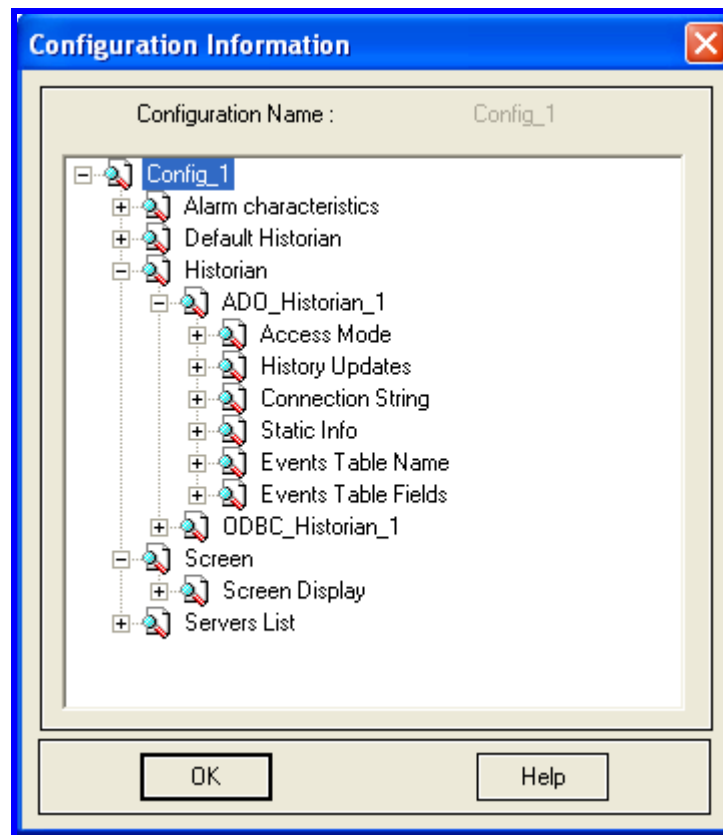
To open an existing configuration, the user should:

1. Select the **configuration name**.
2. Click the **Apply** button.

The selected configuration will be then loaded.



To view additional information about the selected configuration, the end-user has to click twice on it. A configuration dialog screen will appear:



**Figure 12: Configuration Information**

### 1.3. CLOSING AN OPENED CONFIGURATION

To close the currently open configuration, the user should select:

- **File** then **Close Configuration** in the Menu Bar
- Or click the **Close Configuration** icon in the Tool Bar.

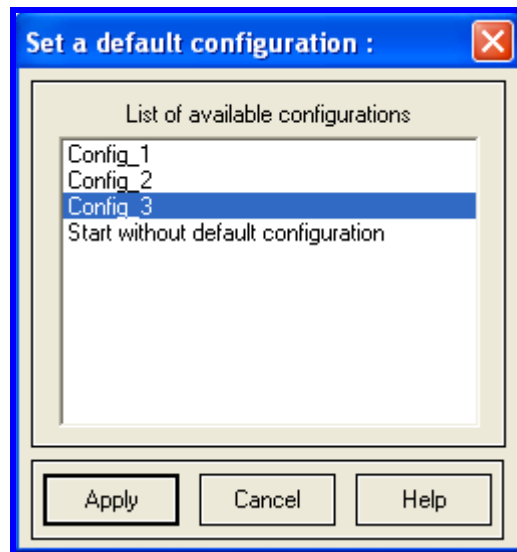
### 1.4. SETTING THE DEFAULT CONFIGURATION

To set the default configuration, the user should select:

- **File** then **Set Default Configuration** in the Menu Bar.

- Or click the **Set Default Configuration** icon in the Tool Bar.

A similar dialog screen appears:



**Figure 13: Set Default Configuration**

To select the default configuration:

1. Select the suitable **Configuration Name**.
2. Click the **Apply** button.

The selected configuration will be considered as the default one.



For detailed information concerning a configuration, double click on the selected configuration.

## 1.5. DELETING A CONFIGURATION

To delete an existing configuration, the user should select:

- **File** then **Delete Configuration** in the Menu Bar.
- Or click **Delete Configuration** in the Tool Bar.

A similar dialog screen appears:

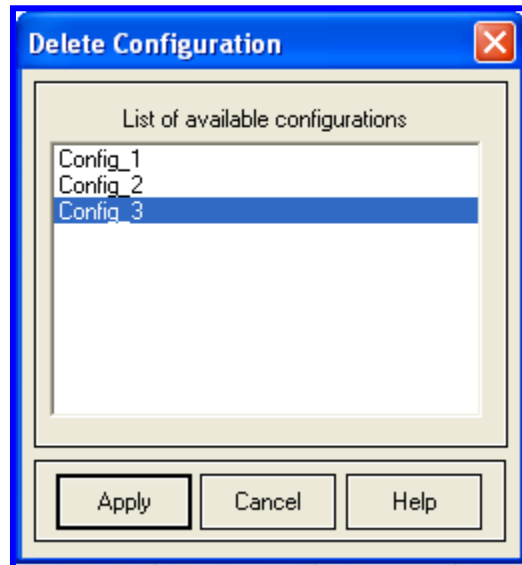


Figure 14: Delete

Configuration

To delete an existing configuration, the user should:

1. Select the **configuration** to delete.
2. Click the **Apply** button.

The selected configuration is then deleted.



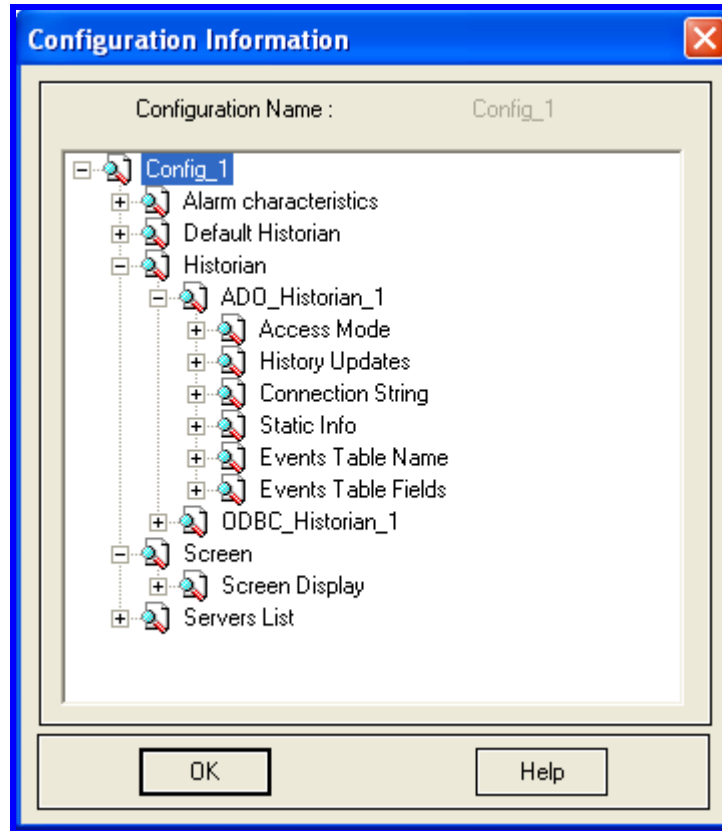
For additional information concerning the selected configuration, double click on the selected configuration name.

## 1.6. VIEWING CONFIGURATION INFORMATION

To view the information related to the current configuration select:

- **File** then **Open Configuration Info** in the Menu Bar
- Or click the **Open Configuration Info** icon in the Tool Bar.

A similar dialog screen appears:



**Figure 15: Configuration Information**

## 2. OPC ALARM AND EVENT MANAGEMENT

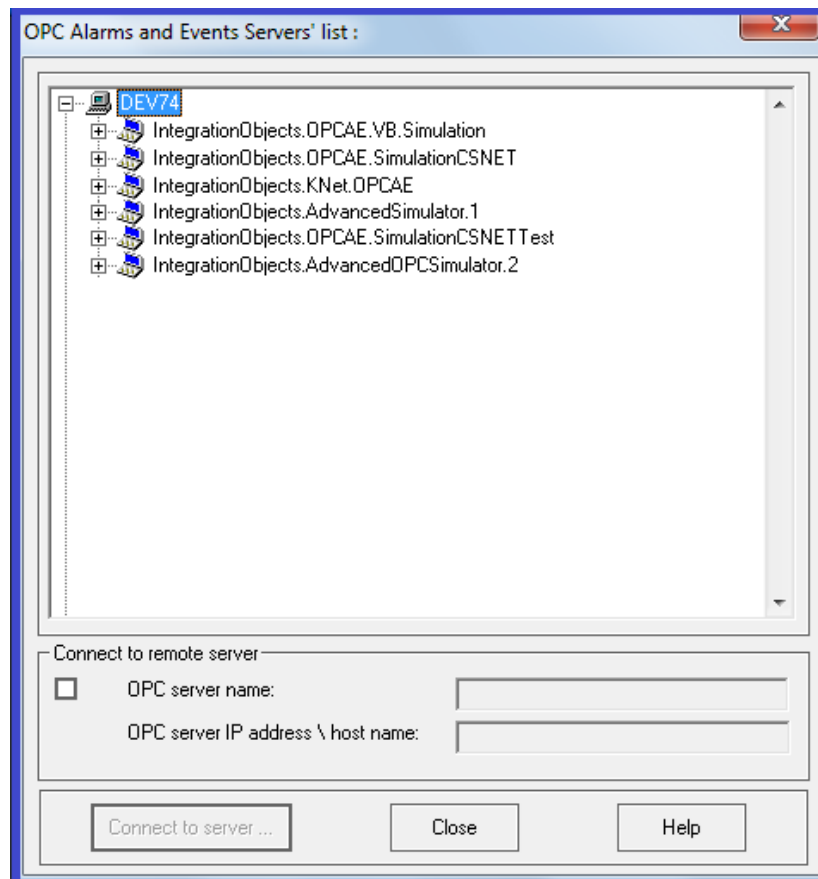
### 2.1. OPC ALARM AND EVENT SERVER MANAGEMENT

#### *Adding an OPC server connection*

To add an OPC server connection, the user should select:

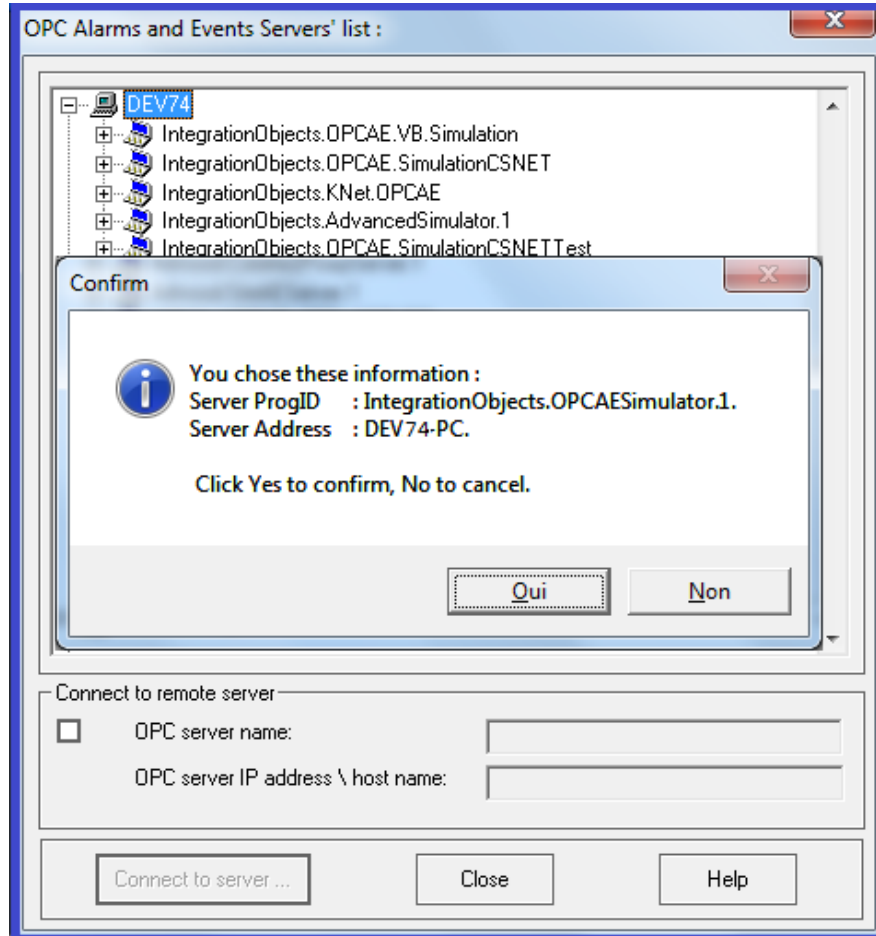
- **OPC Servers** then **Connect To Server** in the Menu Bar
- Or click the **Connect to an OPC AE Server** icon in the Tool Bar.

A similar dialog screen appears:



**Figure 16: Server List**





**Figure 17: Confirm Choice**

There are two options for adding a new OPC server connection.

First option:

1. Double-Click on the OPC server you wish to connect to.

Second Option:

1. Check the **Connect to remote server** option.
2. Type the name of your OPC AE server (called also ProgID) in the **OPC server name** text box.
3. Type the IP address or the node name of the machine hosting your server in the **OPC server IP address \ host name** text box.
4. Click **Connect to server**.

### *Initializing an OPC server connection*

The server can be initialized using two different connection types by checking the appropriate radio button:

- **Local:** when this radio button is checked, the connection will be initiated to an out-process connection only.
- **ALL:** once checked, the OPC server will be initialized for both in-process and out-process connections, without distinction.

### *Deleting an OPC server connection*

To delete an existing OPC server connection, select the appropriate OPC server then right-click the **Remove Server** menu item.

### *Disconnect an OPC server*

To disconnect an existing OPC server, select the appropriate OPC server then right-click the **Disconnect Server** menu item.

### *Deleting All OPC servers' connections*

To delete all OPC server connections, the user should select:

- **OPC Servers** then **Remove All Servers** in the Menu Bar
- Or click the **Remove All Servers** icon in the Tool Bar.

### *Disconnecting All OPC servers*

To disconnect all OPC servers, the user should select:

- **OPC Servers** then **Disconnect All Servers** in the Menu Bar
- Or click the **Disconnect All Servers** icon in the Tool Bar.

### *Viewing the properties of an OPC AE server*

To view the properties of an OPC AE server, the user should right-click on the wanted OPC server then select the **Server Status** menu item.

A similar dialog screen appears:

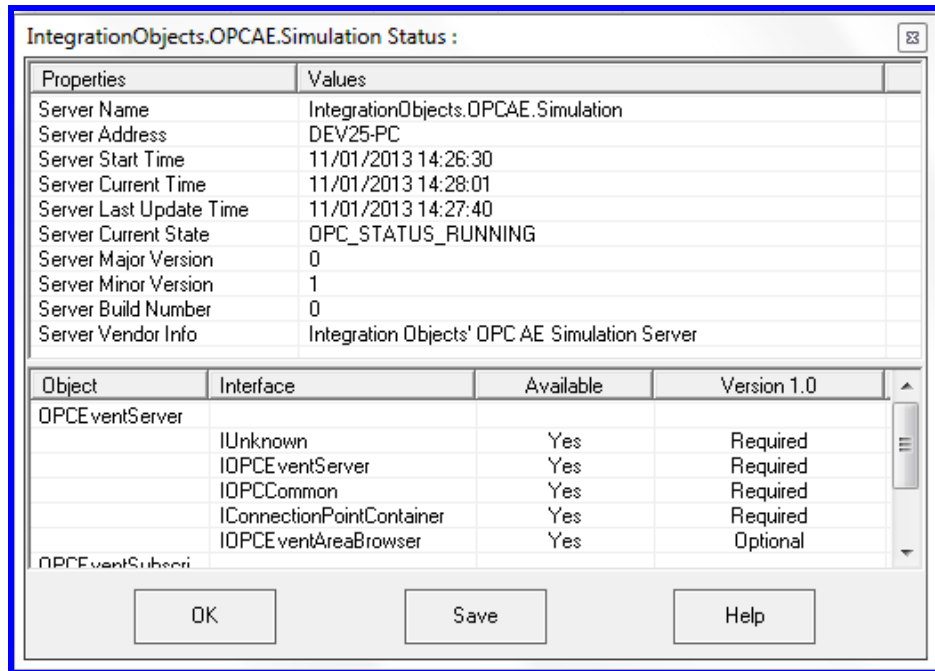


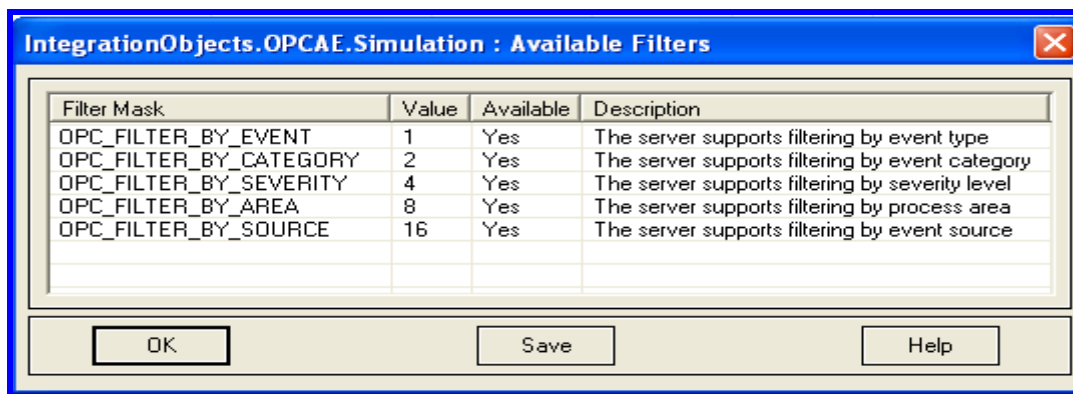
Figure 18: Server Status

The user can save this information in an XML file.

*Viewing the available filters in an OPC AE server*

To view the filters of an OPC AE server, the user should right-click on the wanted OPC server and then select the **Display Available Filters** menu item.

A similar dialog screen appears:



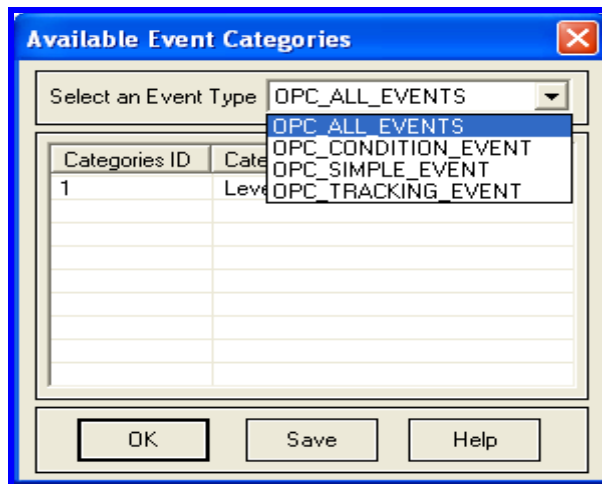
**Figure 19: Display Available Filters**

This provides a way to find out which filter criteria are supported by a given OPC AE server.

*Viewing the available categories of an OPC AE server*

To view the available categories of an OPC AE server, the user should right-click on the wanted OPC server then select the **Display Available Categories** menu item.

A similar dialog screen appears:

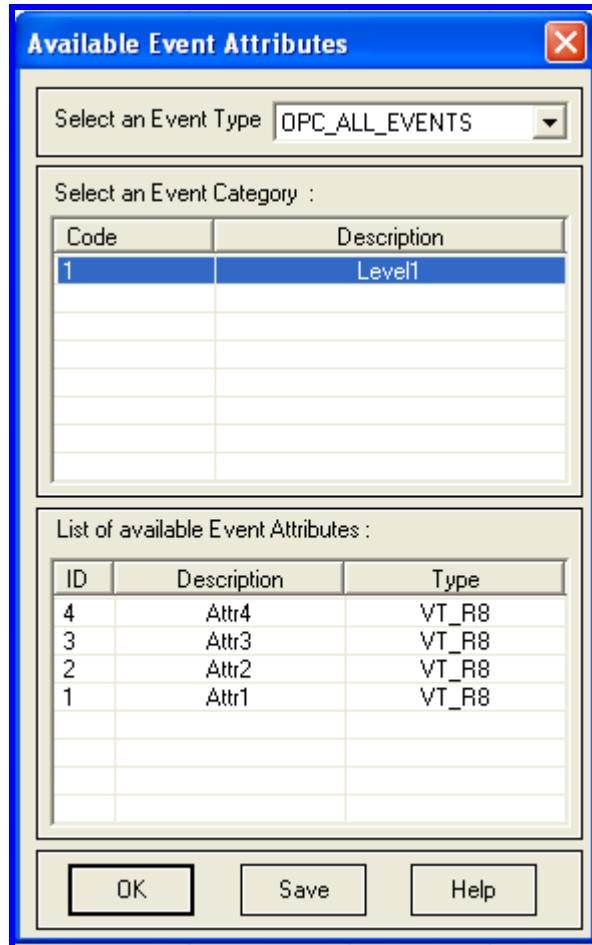


**Figure 20: Available Categories**

This provides a way to find out the categories of events supported by a given OPC AE server.

*Viewing the available event attributes of an OPC AE server*

To view the available event attributes of an OPC AE server, the user should right-click on the wanted OPC server then select the **Display Available Event Attributes: Event Category --> Event Attributes** menu item. A similar dialog screen appears:



**Figure 21: Available Event Attributes**

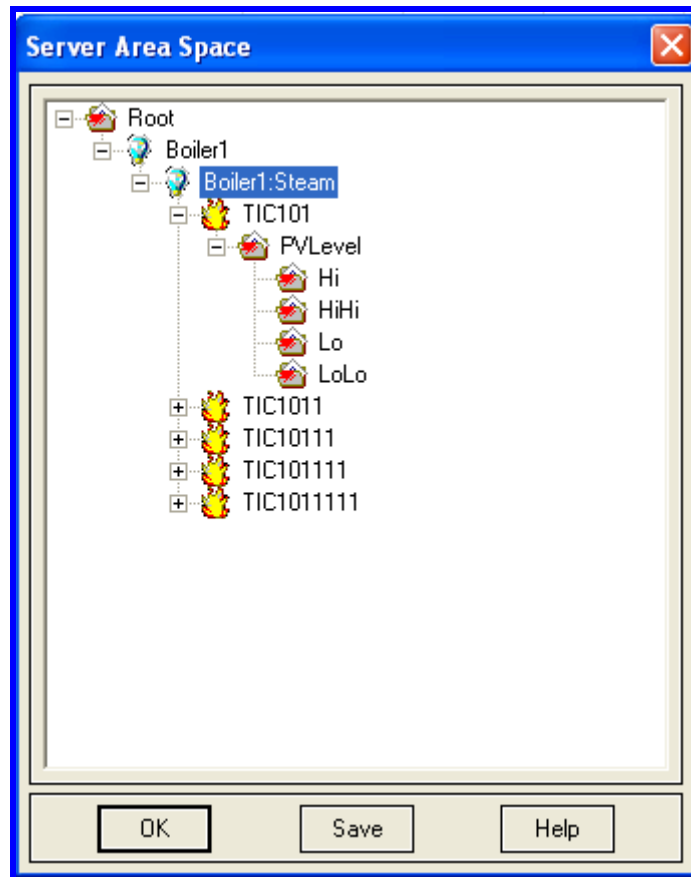
This provides information concerning the vendor-specific attributes of the selected OPC AE server.

To view available attributes:

1. Select an Event Type from the combo box.  
The event categories related to this "Event Type" appear in the event categories' list.
2. Double-click on one of the listed event categories. The list of available Event Attributes appears in the bottom list.

### *Browsing the structure of an OPC AE server*

To view the structure of an OPC AE server, the user should right-click on the wanted OPC server and then select the **Display Area and Source Browser** menu item. A similar dialog screen appears:



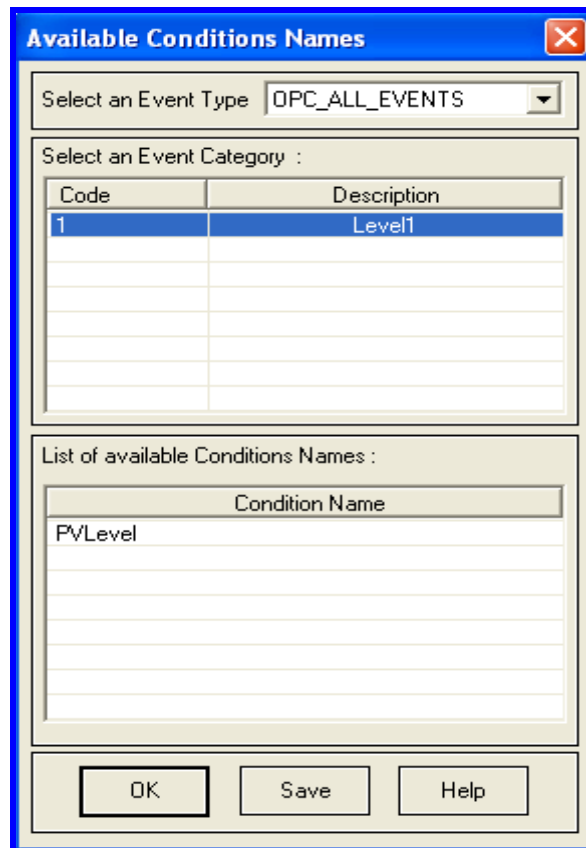
**Figure 22: Display Area and Source Browser**

This dialog provides a view of the OPC server structure in the form of a tree view. It allows the user to navigate the structure interactively and discover the different existing areas and sources.

### *Viewing the Available Condition Names of an OPC AE server*

To view the available condition names of an OPC AE server, the user should right-click on the wanted OPC server then select the **Display Available Condition Name: Event Category --> Condition Names** menu item.

A similar dialog screen appears:



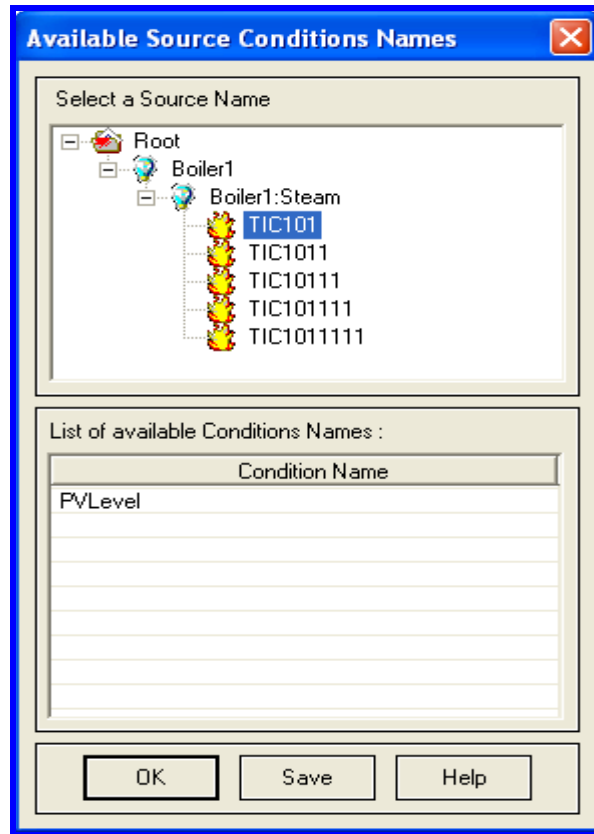
**Figure 23: Display Condition Names**

This provides a way to determine the condition names associated with a specific event category inside an OPC AE server. To view the available condition names:

1. Select an “Event Type” from the combo box.  
 The condition names related to this event type appear in the event categories list.
2. Double-click on one of the listed event categories. The list of available condition names appears in the bottom list.

*Viewing the available Source Condition Names in an OPC AE server*

To view the available source condition names in an OPC AE server, the user should right-click on the wanted OPC server and then select the **Display Available SourceConditionName: Source → ConditionNames** menu item. A similar dialog screen appears:



**Figure 24: Available Source Condition Names**

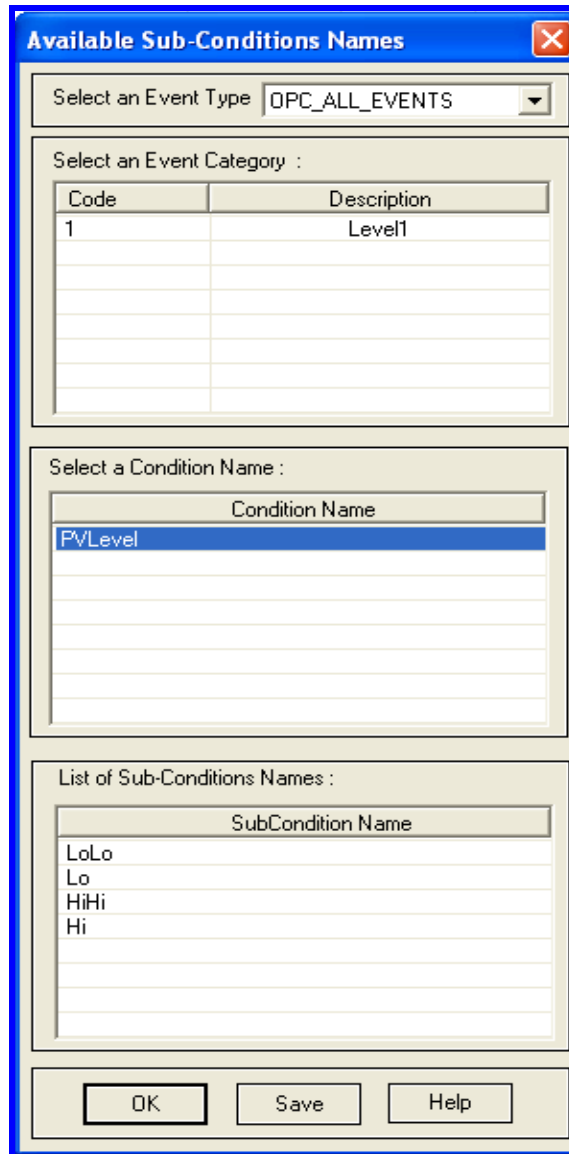
This provides the condition names associated with the specified source. To find out the available source condition names:

1. Select a source name from the area and source tree structure.
2. Double-click on the desired source. The list of condition names associated with this source name will appear in the bottom list.

*Viewing the available Sub-Condition Names in an OPC AE server*



To view the available sub-condition names in an OPC AE server, the user should right-click on the wanted OPC then select the **Display Available SubConditionName: ConditionName --> SubCondition Names** menu item. A similar dialog screen appears:



**Available Sub-Conditions Names**

Select an Event Type: OPC\_ALL\_EVENTS

Select an Event Category :

Code	Description
1	Level1

Select a Condition Name :

Condition Name
FVLevel

List of Sub-Conditions Names :

SubCondition Name
LoLo
Lo
HiHi
Hi

OK Save Help

**Figure 25: Available Subconditions**

This provides a way to find out the sub-condition names associated with the specified condition's name. The user has to:

1. Select an Event Type from the combo box.

- The list of event categories related to this selected Event Type will appear in the event categories list.
2. Double-click on one of the listed event categories. The list of condition names related to the selected event category will appear.
  3. Double-click on one of the listed condition names. The list of sub-condition names appears in the bottom list.

### *Getting a condition state*

To view a condition state, the user should right-click on the desired OPC server and then select the **Get Condition State** menu item. A similar dialog screen appears:

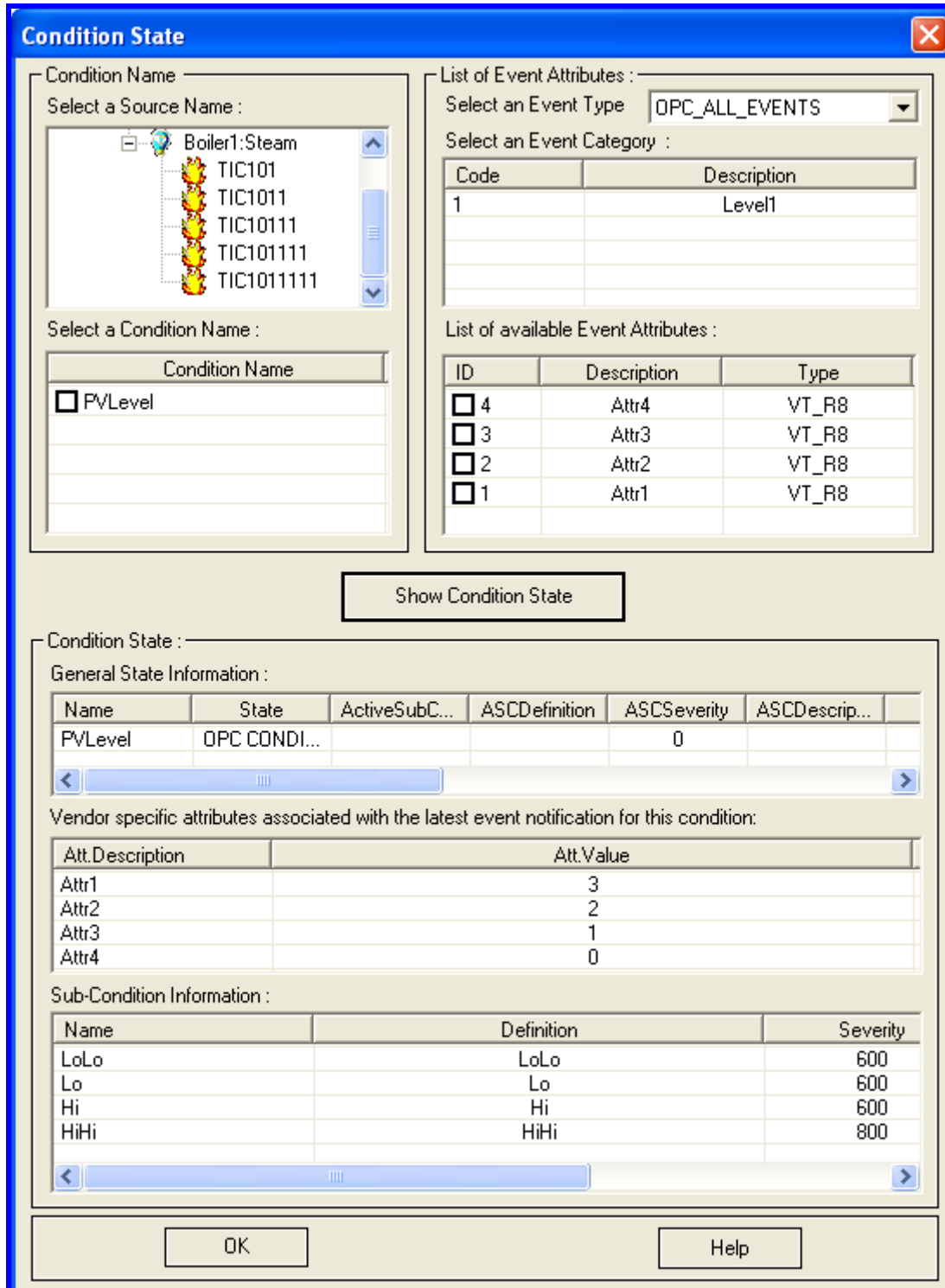


Figure 26: Condition State

This displays the current state information of a condition instance for a given source name and condition name. The user has to:

1. Select a source name from the area and source tree structure.
2. Double-click on the selected source. The list of available condition names related to this source name will appear in the bottom list.
3. Select a condition name from the previously generated list.
4. Select an event type from the combo box.

The related event categories list is generated.

5. Double-click on an event category. The list of available event attributes will be displayed.
6. Select an event attribute from the previously generated list.
7. Click on **Show Condition State**.

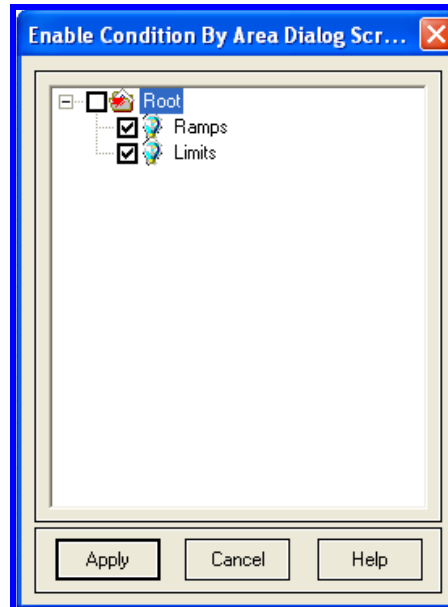
**Result:**

The general condition information list displays the characteristics related to the condition. The sub-condition list provides information related to the sub-condition of the selected condition.

***Enabling condition by area***

To enable a condition by area, the user should right-click on the desired OPC server then select the ***Enable Condition By Area*** menu item.

A similar dialog screen appears:



**Figure 27: Enable Condition by Area**

This allows the user to place all conditions for all sources within the specified process areas into the enabled state. Therefore, the server will generate condition-related events for these conditions.

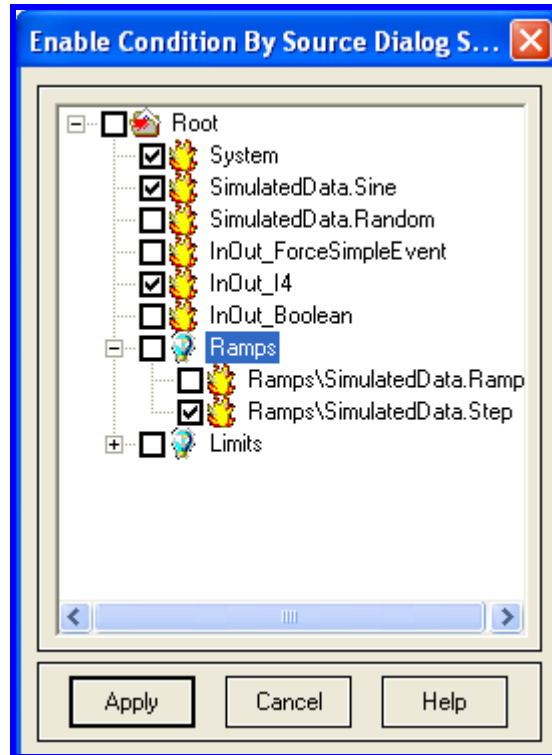
To achieve this, the user has to:

1. Select the list of areas to enable from the tree structure (the user can select just a parent item and the children items will be added automatically).
2. Press the **Apply** button.

### *Enabling condition by source*

To enable a condition by source, the user should right-click on the desired OPC server then select the **Enable Condition By Source** menu item.

A similar dialog screen appears:



**Figure 28: Enable Condition by Source**

This allows the user to place all conditions for the specified event sources into the enabled state. Therefore, the server will generate condition-related events for these conditions.

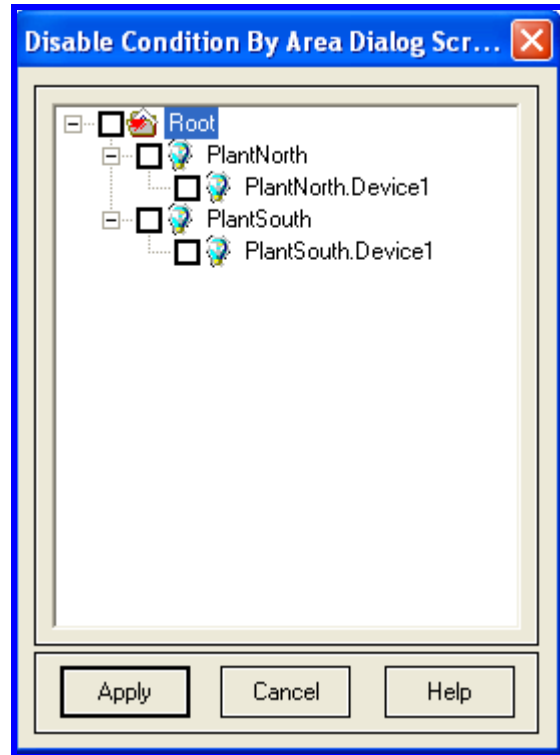
To achieve this, the user has to:

1. Select the list of source names to enable from the tree structure (the user can select just a parent item and the children items will be added automatically).
2. Press the **Apply** button.

### *Disabling condition by area*

To disable a condition by an area, the user should right-click on the desired OPC server then select the **Disable Condition By Area** menu item.

A similar dialog screen appears:



**Figure 29: Disable Condition by Area**

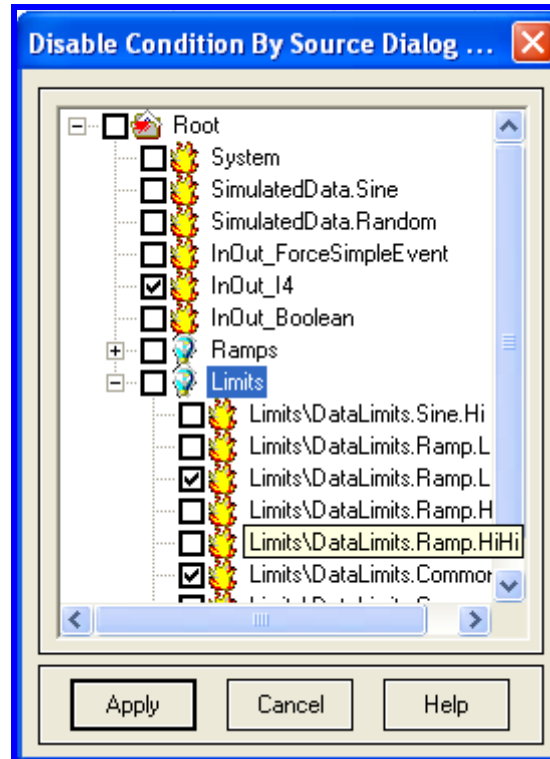
This allows the user to place all conditions for all sources within the specified process areas into the disabled state. Therefore, the server will then cease generating condition-related events for these conditions. To achieve this, the user has to:

1. Select the list of areas to disable from the tree structure (the user can select just a parent item and the children items will be added automatically).
2. Press the **Apply** button.

#### *Disabling condition by source*

To disable a condition by source, the user should right-click on the desired OPC server then select the **Disable Condition By Source** menu item.

A similar dialog screen appears:



**Figure 30: Disable Condition by Source**

This allows the user to place all conditions for the specified event sources into the disabled state. Therefore, the server will no longer generate condition-related events for these conditions.

To achieve this, the user has to:

1. Select the list of source names to disable from the tree structure (the user can select just a parent item and the children items will be added automatically).
2. Press the **Apply** button.

### **Ack Condition**

To acknowledge one or more conditions in the OPC AE server, the user has to apply the AckCondition method.

This AckCondition method specifically acknowledges the conditions becoming active or transitioning into a different sub-condition.

The Alarms and Events Explorer provides the user with the possibility to automatically acknowledge one or more conditions. To do this, the user can:

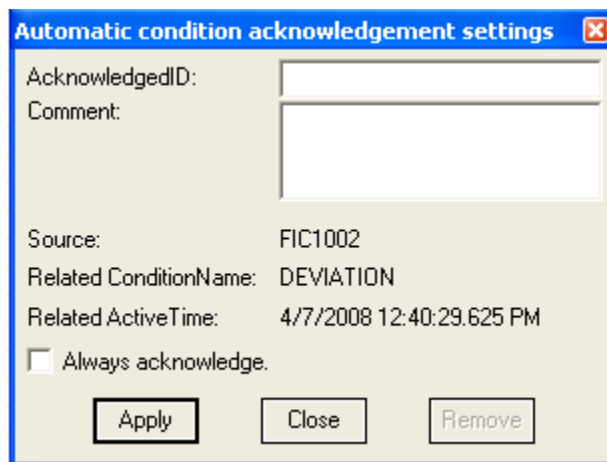


1. Double-click on the specified source name from the screen browser (The AE Explorer will acknowledge the related condition with the “**AEEplorer**” ActorID).

Condition	Sub-Condition	Mask	New State	Event Type	Event Category	AckReq	Active Time	Cookie	Actor ID
DEVIATION		OP...	OPC_CO...	OPC_CONDITION...	Level2	Not required	4/7/2008 12:39:1...	26030308	
				OPC_SIMPLE_EVE...	Level3				
				OPC_TRACKING_...	Level4				localhost
PVLEVEL	LOLO	OP...	OPC_CO...	OPC_CONDITION...	Level1	The related condition requires acknow...	4/7/2008 12:39:2...	26025316	AEEplorer
DEVIATION	DEVIATION	OP...	OPC_CO...	OPC_CONDITION...	Level2	The related condition requires acknow...	4/7/2008 12:39:2...	26026572	AEEplorer
PVLEVEL	LO	OP...	OPC_CO...	OPC_CONDITION...	Level1	The related condition requires acknow...	4/7/2008 12:39:3...	26029036	AEEplorer

**Figure 31: AE Explorer Screen Browser**

2. Right-click on the specified source name from the screen browser. The dialog screen will appear:



**Figure 32: Automatic Condition Acknowledgement Settings**

**AcknowledgedID:** A string passed in by the client identifying who is acknowledging the conditions.

**Comment:** Comment string passed in by the client associated with acknowledging the conditions.

**Source:** identifies the source of each condition that is being acknowledged.

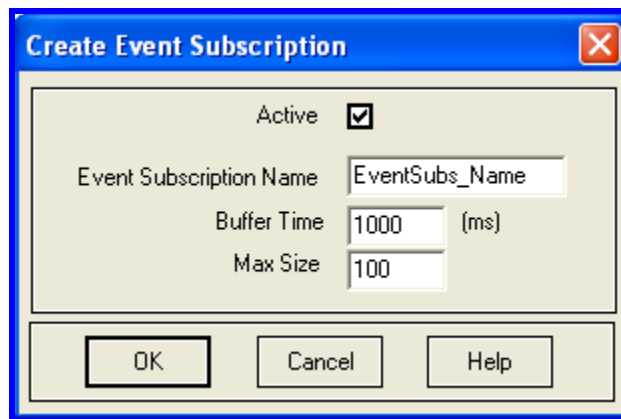
**Related ConditionName:** identifies each condition that is being acknowledged.

**Related ActiveTime:** This parameter uniquely identifies a specific transition of the condition to the active state or into a different sub-condition and is the same as the SubCondLastActive condition attribute.

**Always acknowledge:** if this option is checked, the AE Explorer will automatically acknowledge the related condition name when it's necessary.

### *Creating a new event subscription*

To view the properties of an OPC AE server, the user should right-click on the desired OPC server and then select the **Create Event Subscription** menu item. A similar dialog screen appears:



**Figure 33: Create Event Subscription**

This allows the user to create a new Event Subscription in the OPC AE server. The user has to fill out the different properties of the subscription:

**Active:** - Checked if the Event Subscription is to be created active.

- Unchecked if the Event Subscription is to be created as inactive. If the subscription is inactive, then the server will not send event notifications to the client based on the subscription, and has no responsibility to buffer or maintain the event notifications. Thus event notifications may be lost.

**Event Subscription Name:** The name to be associated with the event subscription.

**Buffer Time:** This field indicates the requested buffer time. The buffer time is in milliseconds and tells the server how often to send event notifications.

**Max Size:** The requested maximum number of events that will be sent in a single callback. A null value means that there is no limit to the number of sent events in a single callback.

## 2.2. OPC ALARMS AND EVENTS SUBSCRIPTION MANAGEMENT

### *Activate an Event Subscription*

To activate an existing Event Subscription, the user should right-click on the desired OPC Event Subscription and then select the **Activate Subscription** menu item.

This way, the user can activate the selected Event Subscription and thus receive the event notifications fired by the related OPC server.

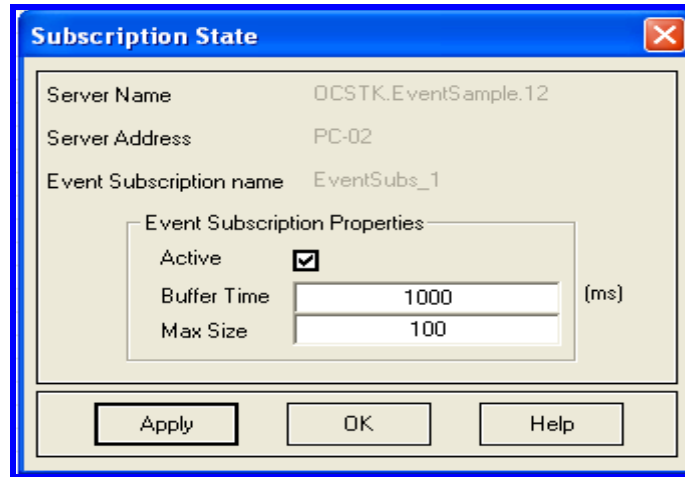
### *Deactivate an Event Subscription*

To deactivate an existing Event Subscription, the user should right-click on the target OPC Event Subscription and then select the **Deactivate Subscription** menu item.

If the user deactivates the Event Subscription, then the server will stop sending the event notifications related to this subscription.

### *Viewing an Event Subscription State*

To set the state of an existing Event Subscription, the user must right-click on the target OPC Event Subscription and then select the **Subscription State** menu item. A similar dialog screen appears:



**Figure 34: Subscription State**

This screen plays two roles. During the initialization, this screen posts the current information related to the selected EventSubscription.

**OPC AE Server Name:** The name of the OPC Server that contains the Event Subscription.

**OPC AE Server Address:** The address of the machine hosting the underlying OPC Server.

**Event Subscription Name:** The name of the current Event Subscription.

**Event Subscription properties:**

**Active:** If this option is unchecked, the Event Subscription will be created inactive. If it is checked, the Event Subscriptions will be created as active. If the subscription is inactive, then the server will not send event notifications to the client based on the subscription.

**Buffer Time:** This field indicates the requested buffer time. The buffer time is in milliseconds and tells the server how often to send event notifications.

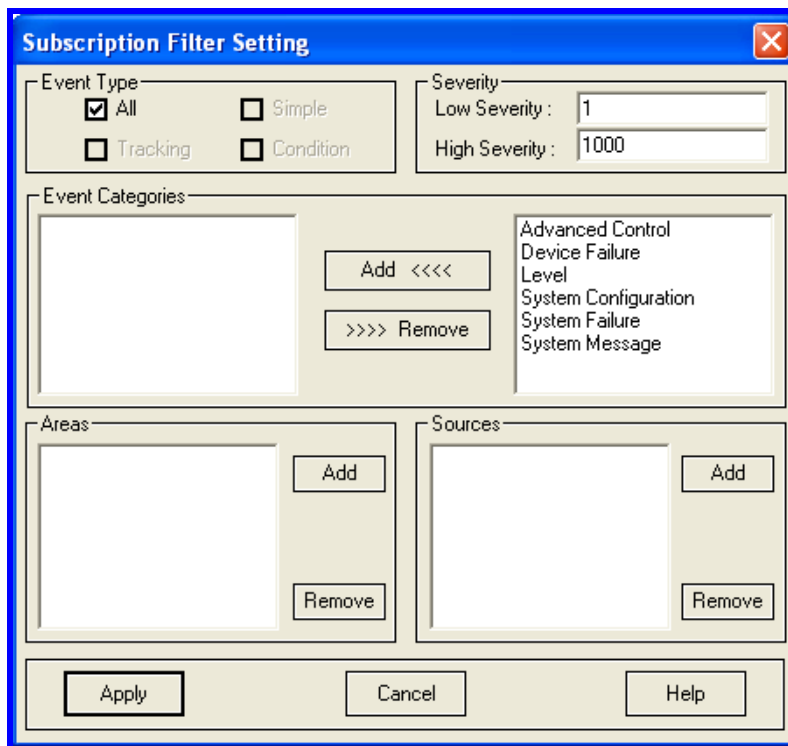
**Max Size:** The requested maximum number of events that will be sent in a single callback. A null value means that there is no limit to the number of sent events in a single callback.

The second role of this screen is that it provides the user with the possibility of modifying this state. The user can modify the state of the Event Subscription (Active or Inactive), the buffer Time or the Max Size, and press the **Apply** button to validate these changes.

### Setting an Event Subscription Filter

To set a filter for an existing Event Subscription, the user should right-click on the target OPC Event Subscription then select the **Subscription Filter** menu item.

A similar dialog screen appears:

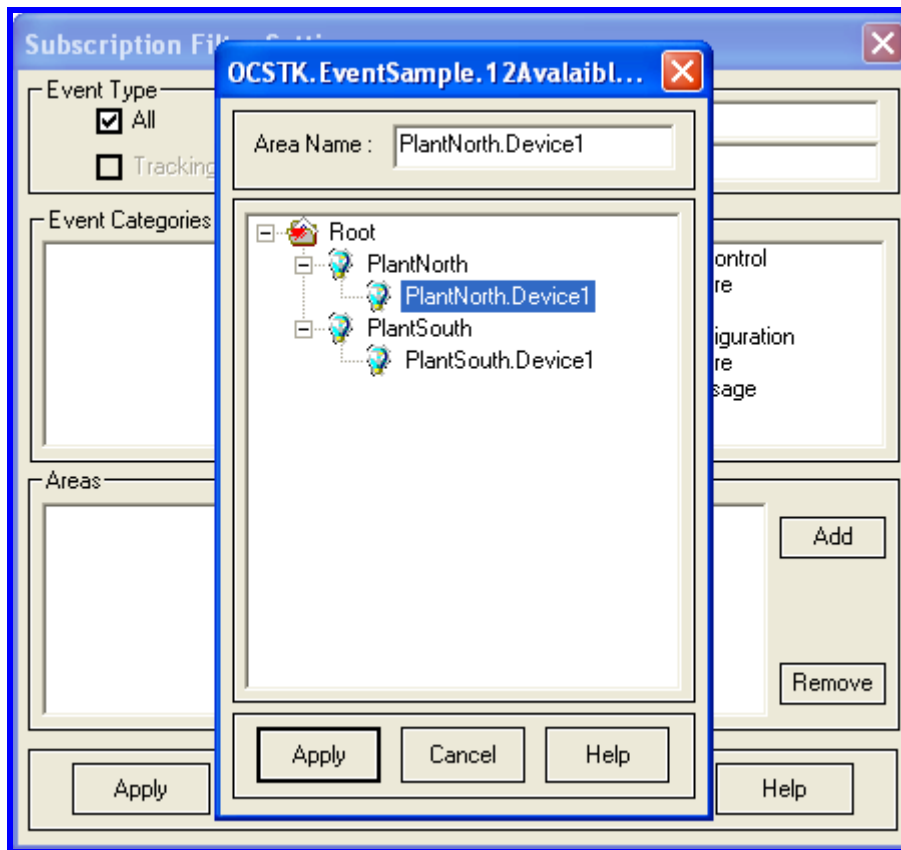


**Figure 35: Subscription Filter Setting**

This allows the user to set the filtering criteria to apply to the event subscription. The following are the possible applicable criteria:

- Type of event (simple, condition, or tracking): the user must check the corresponding Check Box.

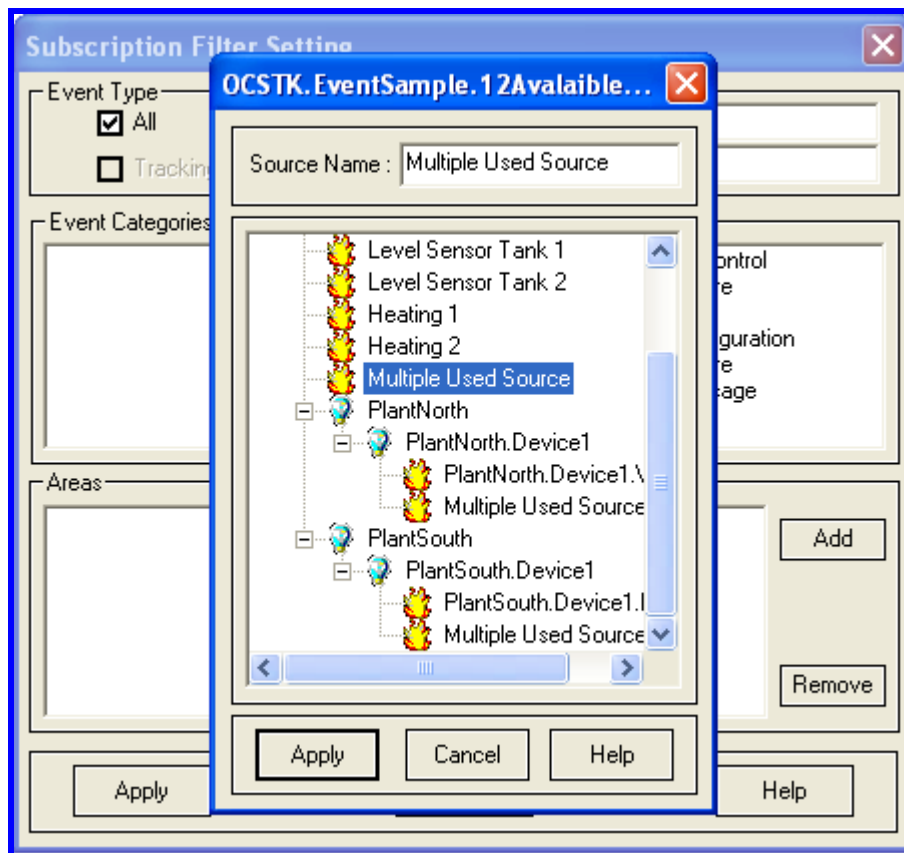
- Event categories: Using the **Add/Remove** button the user can add/remove event categories from the filter. The right list box contains the event categories supported by the current related OPC AE server. The left list box contains the event categories added to this filter.
- Lowest severity (i.e. all events with a severity greater than or equal to the specified severity): The user must type a value for the Low Severity in the Low Severity text box.
- Highest severity (i.e. all events with a severity less than or equal to the specified severity): The user must type a value for the Highest Severity in the Highest Severity text box.
- Process areas: to add an area to the current filter, the user must press the left **Add** button, a similar dialog screen appears:



**Figure 36: Add Area**

After selecting an **area name**, press the **Apply** button to validate this operation: the selected **area name** is added to the **left list box**. This area is then added to the **filter**. If you want to remove it, select the **area name** and press the left **Remove** button.

- Event Sources: to add a source to the current filter, the user must press the right **Add** button. A similar dialog screen appears:



**Figure 37: Add a Source**

After selecting a **source name**, press the **Apply** button to validate this operation: the selected **source name** is added to the **right list box**. This **source** is then added to the **filter**. If you want to remove it, select the **source name** and press the right **Remove** button.

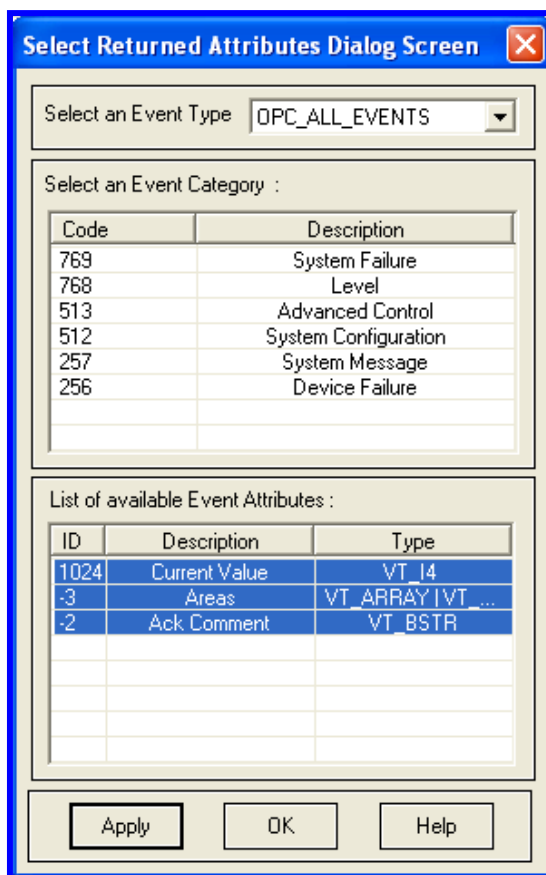
A list of values for a single criterion are logically ORed together (e.g. if two event categories are specified, event notifications for both categories will be received). If multiple criteria are specified, they will be logically ANDed together, i.e. only events satisfying all criteria will be selected. For example, specifying both lowest severity and highest severity will result in the selection of events with severities lying between the two values.

### ***Selecting Returned Attributes***

To retrieve the attributes of an existing Event Subscription, the user should right-click on the target OPC Event Subscription and then select the ***Select Returned Attributes*** menu item. ^

For each event category, *SelectReturnedAttributes* picks out the attributes to return with event notifications. This method can be called many times in order to specify the attributes to return for each unique event type and event category pair. If this is called multiple times for the same event type and event category pair, only the latest call will be taken into account.



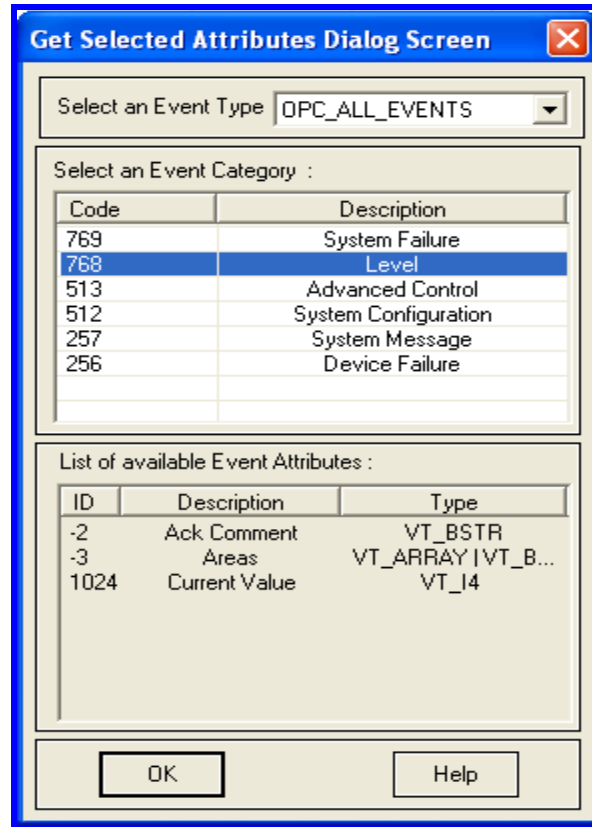


**Figure 38: Select Returned Attributes**

### *Getting Returned Attributes*

To get the attributes of an existing Event Subscription, the user should right-click on the target OPC Event Subscription and then select the ***Get Returned Attributes*** menu item.

For each event category, *GetReturnedAttributes* retrieves the attributes previously specified by the user on the *SelectReturnedAttributes* dialog.



**Figure 39: Get Returned Attributes**

### *Refreshing an Event Subscription*

To refresh an existing Event Subscription, the user should right-click on the target OPC Event Subscription then select the **Refresh Subscription** menu item.

This operation forces the refresh of all active and inactive conditions related to the selected Event Subscription.

### *Canceling Refresh for an Event Subscription*

To cancel the refresh for an existing Event Subscription, the user should right-click on the target OPC Event Subscription then select the **Cancel Refresh Subscription** menu item.

### *Removing an Event Subscription*

To remove an existing Event Subscription, the user should right-click on the target OPC Event Subscription and then select the **Remove Subscription** menu item.

This operation removes the selected Event Subscription from the context of the related OPC AE server and from the current configuration setting.

# USING OPC AE Explorer

## 1. OVERVIEW

The installation program for the **A&E Explorer** comes on either CD-ROM or floppy disks. Insert the distribution media into the appropriate drive. Run the installation program following these steps:

- Open Windows Explorer,
- Select the drive where the distribution medium resides,
- Double-click on the program **setup.exe**,
- Follow the instructions presented by the installer.

To start the **OPC AE Explorer**: Click **Start → Programs → Integration Objects → OPC Explorer → OPC Alarms and Events Explorer**

## 2. REQUIRED STEPS

In this section, we are going to provide a global view of the OPC Alarms and Events Explorer usage.

### 2.1. STEP N°1: CREATE A NEW CONFIGURATION

In order to create a new configuration as it's mentioned in the section "Create New Configuration", the user must start by creating the configuration, by attributing a unique name to it and by choosing the mode of authentication to use with this configuration.

## **2.2. STEP N°2: ADDING SERVERS TO CONTROL**

After the configuration installation, the user must fill in this form. To do so, he must start by adding the servers to supervise.

These servers will be stored in the context of the currently opened configuration.

## **2.3. STEP N°3: SUBSCRIPTIONS INSTALLATION**

After adding the servers to be controlled, the user can move to the subscriptions' installations and the setting of filters to be associated with the latter. At this stage, the user can see the events notifications returned by all added servers in the screen.

# APPENDIX A: LOGGING

The A&E Explorer produces a log file named “LogEvent.LOG” that records errors and debugging information. If difficulties occur with the A&E Explorer, the log file can be extremely valuable for troubleshooting. Under normal operations, the client logs very little information.

This log file is generated at start-up under the setup folder, where the AEE Explorer.exe is located.

The AE Explorer incorporates a configuration file “ConfigFile.ini” which includes several logging parameters. All of these parameters have default settings and can be changed at start-up by editing the configuration file.

To change this file:

1. Open ConfigFile.ini in a text editor.
2. Edit any of the parameters listed in the following tables:

Log Setting	Description	Default Value
LogLevel	Level related to the Log File.	0
LogFileMaxSize	The maximum log file size, in bytes. Once this size is reached during run-time, the log file is overwritten.	1048576*2 ~ 2 Mo (Megabyte)
ArchiveLastLog	TRUE: Old file is copied to an intermediate file with incremental extension, before being overwritten. FALSE: Any pre-existing log file is erased and overwritten at start-up.	FALSE
Investigate	Set investigate to 0 to disable the reconnection in the OPC AE Explorer.	1
Reconnection-TimeOut	If Reconnection TimeOut is set to 0, OPC AE Explorer will not initiate the reconnect if there are no new alarms received from the OPC AE server. It will reconnect only if there is	30 (minutes)

	connection problem with the OPC AE server. If Reconnection TimeOut value is higher than 0, the OPC AE Explorer will reconnect if there are no new alarms during the configured period	
--	--	--

3. Save the file for the log settings and performance parameter to take effect.

*Sample Configuration File:*

```
[LogSetting]
LogLevel=0
LogFileMaxSize=2097152
ArchiveLastLog=False
Investigate=1
Reconnection-TimeOut=30
```

# APPENDIX B: DCOM CONFIGURATION

In order to retrieve data from OPC Server(s) in real time, the **AE Explorer** can be used in different configurations, including local and distributed configurations.

In local configuration, the **AE Explorer** and OPC Server(s) all run on the same computer. In that case, the installation process does not need any specific settings.

In distributed configuration, these components are executed on two or more computers cooperatively: the **AE Explorer** initially resides on a remote computer (Client Computer) and uses the DCOM mechanism to directly access server(s).

*To enable this functionality, some settings are needed on both the remote server and the local client computer.*

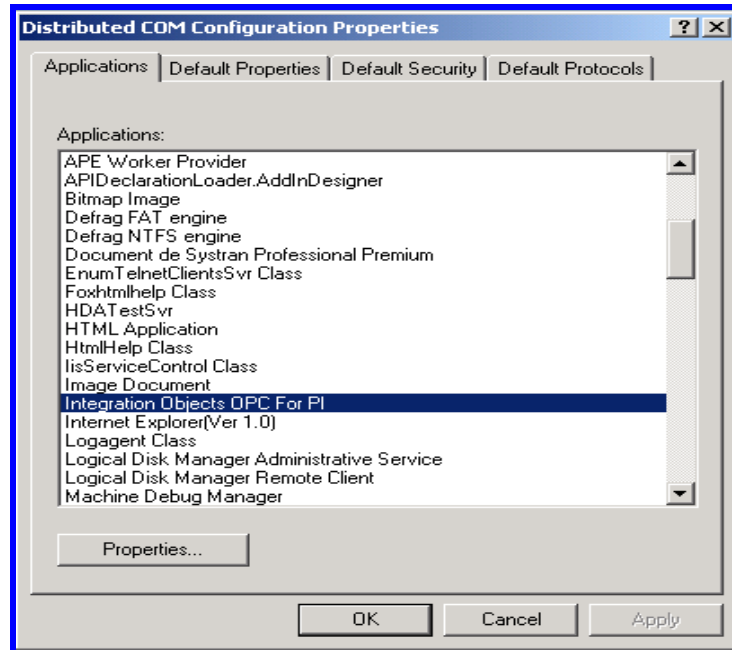
This section is intended to provide general guidance on proper DCOM Config Utility settings for computers on which the **AE Explorer** and OPC server(s) are running.

## 1. Client Side DCOM Configuration

**Step 1:** Setup Client machine with these instructions

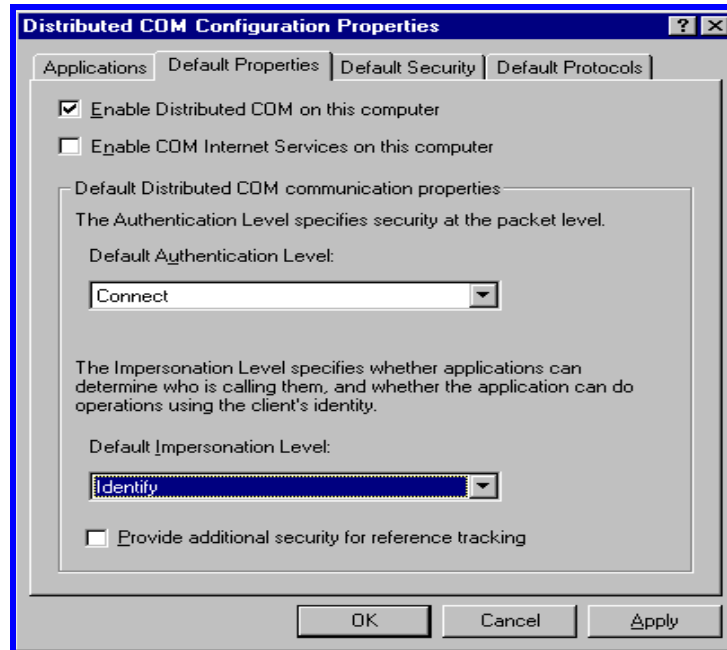
1. Login as Administrator.
2. Choose the Run Option from the windows start menu and type DCOMCNFG then click **OK** to run it. When you first launch the utility, it will look like this:





3. DCOM Configuration Properties-Default Properties Tab:

- a. The **Enable Distributed COM on this computer** MUST be checked.
- b. The **Default Authentication Level** should be set to **Connect**.
- c. The **Default Impersonation Level** should be set to **Identity**.



4. DCOM Configuration Properties-Default Security Tab:

It is on this tab that you tell the operating system whom you will allow to access the **AE Explorer** from remote OPC servers. **Default Access Permissions** is the only setting we are concerned with on the client side of this tab.

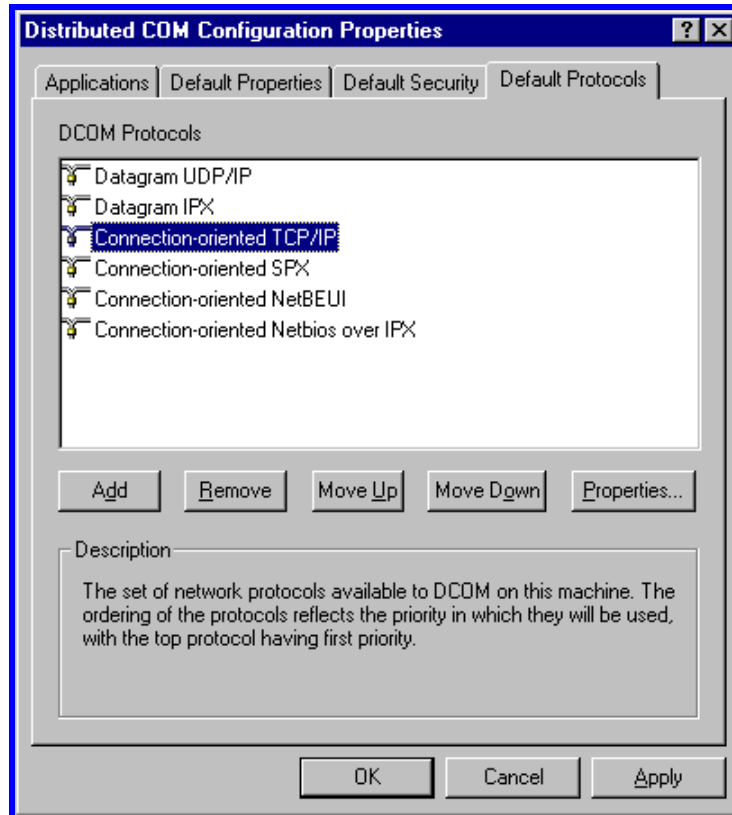
On the Default Access Permissions Dialog, you will set who (users whose remote OPC servers are running under) will have access to make callbacks to this machine when subscription based reads are being done.

No changes are normally required on **Default Launch Permissions** and **Default Configuration Permissions** dialogs.



5. DCOM Configuration Properties-Default Protocols Tab:

On this tab you set which of the installed network protocols on the client computer to use for DCOM. You should use **Connection-oriented TCP/IP**.



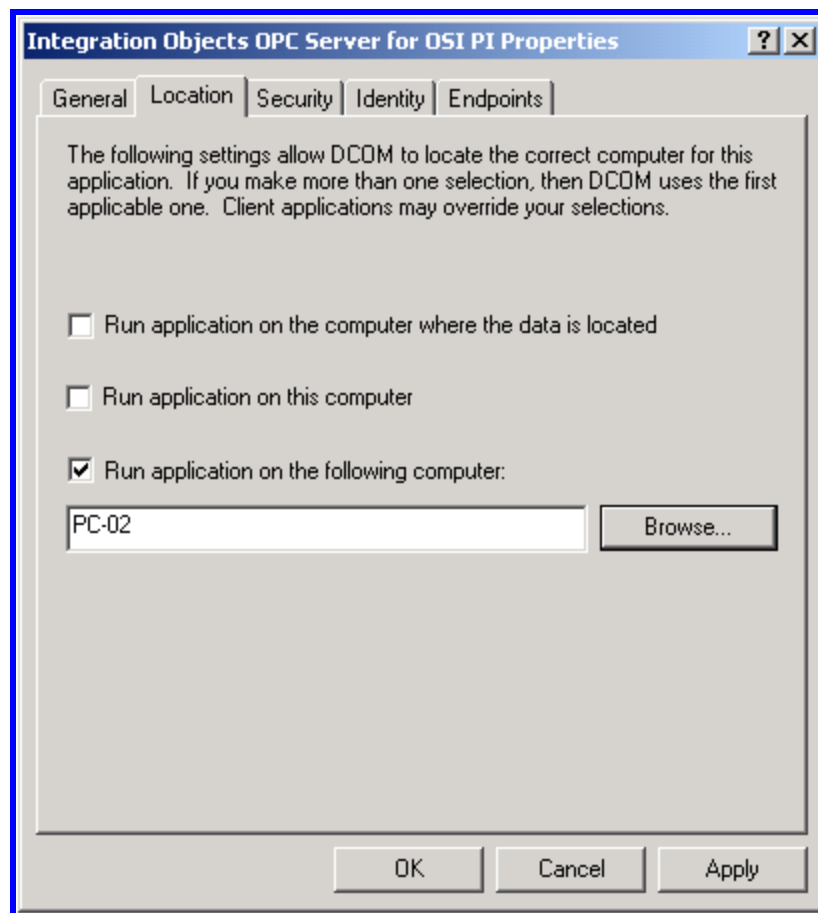
**Step 2:** You need to register your OPC Server on the client computer by indicating its location on the named remote machine.

There are two ways of registering your OPC server on your client machine, depending on the client environment. Here are two methods:

1. Prepare and apply a customized **.reg** file on the client computer (See Microsoft registry documentation for details). We recommend this method only for users experienced with Windows Registry.  
You have to *export* the entries of your OPC server from the server machine registry to the client machine registry.
2. Alternatively, install and configure your OPC Server on the client computer. This action self-registers the server in the System Registry. This is the easiest way for an automatic registration.

Then, use the following steps to verify that the OPC server machine is properly delegated:

- a. On the client machine, run the DCOM Config Utility (Dcomcnfg.exe).
- b. Select your OPC server from the Applications tab and choose Properties.
- c. On the General tab, be sure that there is an entry for Remote Computer and that the remote computer name is correct.
- d. If the computer name is incorrect, select the Location tab.
- e. Make sure the Run application on the following computer setting is checked. In the Dialog box beneath this selection, type in the correct computer name for your OPC server (see the figure below).



You can also use the following steps to verify the remote computer name by using the Windows Registry:

1. Run RegEdit.exe.
2. The remote server name is specified in the following registry key:

HKEY\_CLASSES\_ROOT\AppID\{The CLSID of the OPC server}\RemoteServerName

## 2. Server Side DCOM Configuration

There are 2 areas you will need to setup:

**Step 1:** Follow these instructions to make default DCOM Configuration for your OPC Server Computer.

1. Launch the DCOM Config Utility on the computer your target OPC Server is running.
2. Configure the Default Properties Tab as you did in Client side.

3. DCOM Configuration Properties-Default Security Tab:

This tab has the most settings to make. It is on this tab that you tell the operating system who you will allow to access OPC servers on this machine (Default Access Permissions), who you will allow to launch OPC Servers on this machine (Default Launch Permissions), and who you will allow to configure OPC Servers on this machine (Default Configuration Permissions).

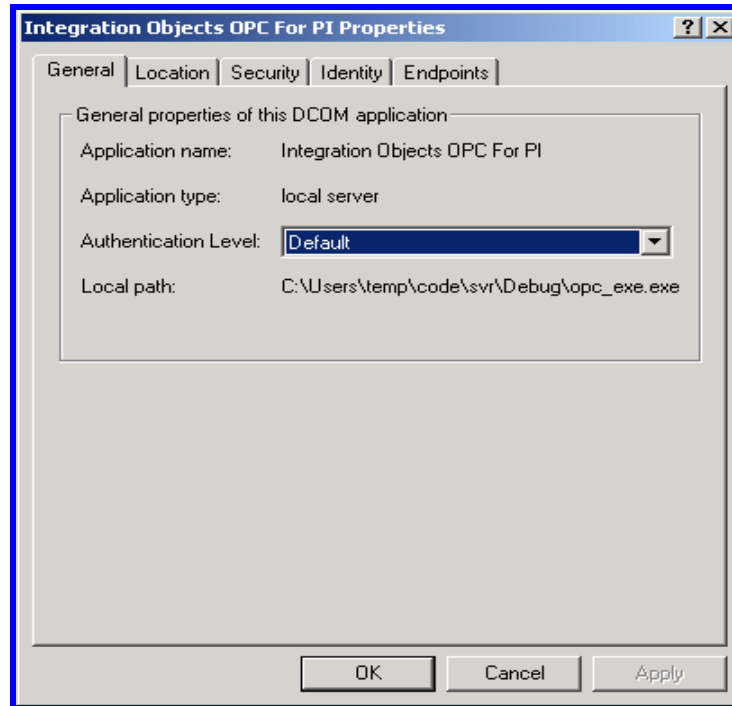
4. DCOM Configuration Properties-Default Security Tab-Default Access Permissions Dialog:

In the dialog, on the right, when you click **Add**, you will be presented with a dialog that lets you browse the local machine and domain (if applicable and logged into a domain) for users and groups to grant permission to.

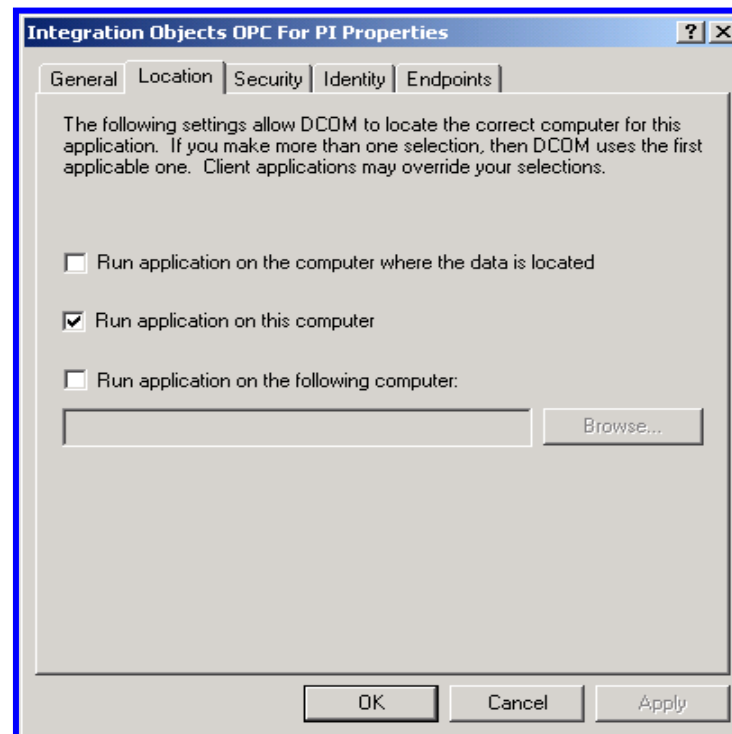
5. DCOM Configuration Properties-Default Security Tab-Default Launch Permissions Dialog:  
It is here where you define who can actually start your OPC server on this computer. Adding of users/groups is done the same way as was done for Access Permissions.
  
6. DCOM Configuration Properties-Default Security Tab-Default Configuration Permissions Dialog: If you are setting up DCOM for the first time, it is not recommended to change these settings.
  
7. Configure the Default Protocols Tab as you did on the Client side.

**Step 2:** To make DCOM settings that are specific to your OPC Server, go to the Application Tab in DCOM Config and browse until you find the OPC Server of your choice. Highlight it and either double click on it or click **Properties** to enter the server specific settings.

1. On the General Tab, we recommend that you leave the **Authentication Level** to **Default**.



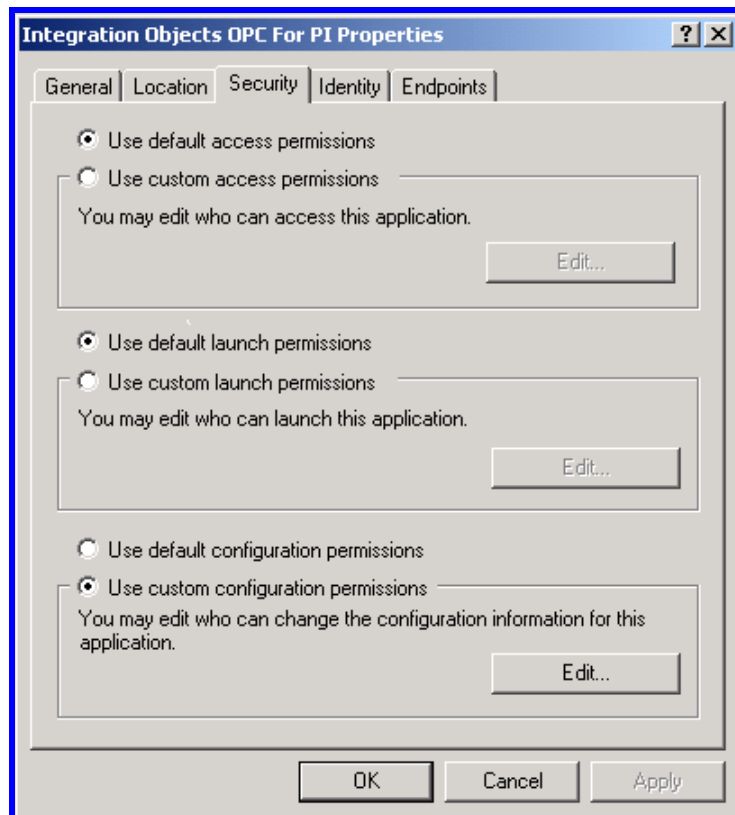
2. On the Location Tab, make sure that the **Run application on this computer** is the **ONLY** check-box checked.





3. On the Security Tab, we suggest you select "Use Default access permissions" which means users/groups shown under the Default Security Tab in the DCOM Config utility will have access to connect to this specific OPC server. If you choose to use the custom permissions to override the defaults, specify which users/groups you wish to grant permission to.

We also suggest that you use the Default Launch permissions. The same rules apply about using custom launch permissions here as they do for custom access permissions.



4. On the Identity Tab, specify under what user account you want the OPC server to run under. In some cases, this is one of the most important settings for the OPC server. The answer is very dependent on how you will be using your system.

No changes are required on the Endpoints Tab.

## APPENDIX C: TIPS FOR CONFIGURING DCOM SERVERS

Here are four tips for configuring DCOM Servers.

1. Users on Trusted Domains need to have an account created for them with matching usernames and passwords on the DCOM server's domain. The purpose of this is to set up a matching SID (Security ID). Trusted Domain group members need to have remote DCOM servers initiated for them by a Primary Domain member.

Note: A Trusted Domain is a setup that allows resources from one domain to access resources on another domain. Trusted Domains typically go in one direction, although they can be bi-directional. The process of one domain trusting another domain and passing user authentication to another domain is called pass-through authentication.

2. Workgroup machines are individual domains, so you must set up matching SIDs (usernames and passwords) to establish connections between the machines.
3. Always create a Global Group through NT Server's User Manager and add the members for whom you want to provide access to specific DCOM servers. Then, use DCOMCnfg to set the launch permissions to that group. This makes administration easy to manage, even if you have a group that contains everyone.

4. If the client application implements a sink (callback), the server must be able to call back to the client. You must configure the client to accept calls from the server. Just because the client can connect to the server does not mean the server can call back to the client.

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